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ANNUAL MONITORING REPORT FOR 1992

REILLY TAR & CHEMICAL CORP.
N.P.L. SITE
ST. LOUIS PARK, MINNESOTA

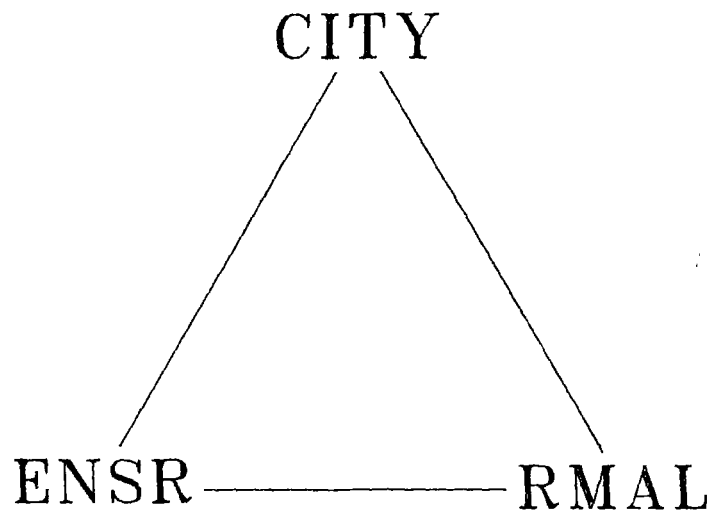
SUBMITTED MARCH 15, 1993

ANNUAL MONITORING REPORT
FOR 1992

REILLY TAR & CHEMICAL CORP.
N.P.L. SITE

ST. LOUIS PARK, MINNESOTA

SUBMITTED MARCH 15, 1993
(INCLUDES APPENDICES A-C)



(INCLUDES APPENDICES A-C)



CERTIFIED MAIL
RETURN RECEIPT REQUESTED

March 15, 1993

Regional Administrator
United States Environmental
Protection Agency, Region 5
ATTN: Darryl Owens
Mail Code 5HS-11
230 South Dearborn Street
Chicago, Illinois 60604

Director, Solid and Hazardous
Waste Division
Minnesota Pollution Control Agency
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St. Paul, Minnesota 55185

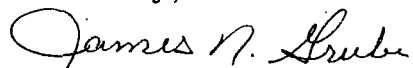
President
Reilly Industries, Inc.
1510 Market Square Center
151 North Delaware
Indianapolis, Indiana 46204

RE: United States of America, et al. vs. Reilly Tar &
Chemical Corporation, et al.
File No. Civ. 4-80-469

Gentlemen:

Enclosed is the 1992 annual monitoring report submitted pursuant to Section 3.4 of the Consent Decree-Remedial Action Plan in the above captioned matter. This report is issued by the City in accordance with Section 2(a) of the Reilly/St. Louis Park Agreement (Exhibit B to the Consent Decree).

Sincerely,


James N. Grube
Director of Public Works

JNG/cmr
enclosure

cc: William Gregg (w/2 enclosures)
Elizabeth Thompson (w/o enclosure)
Reilly File

ANNUAL MONITORING REPORT

FOR 1992

SUBMITTED TO THE

**REGIONAL ADMINISTRATOR
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION V**

**EXECUTIVE DIRECTOR
MINNESOTA POLLUTION CONTROL AGENCY**

BY

THE CITY OF ST. LOUIS PARK

**PURSUANT TO
CONSENT DECREE - REMEDIAL ACTION PLAN
SECTION 3.4**

UNITED STATES OF AMERICA, ET AL.

vs.

REILLY TAR AND CHEMICAL CORPORATION, ET AL.

**UNITED STATES DISTRICT COURT
DISTRICT OF MINNESOTA
CIVIL NO. 4-80-469**

MARCH 15, 1993

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1.0 INTRODUCTION

Pursuant to Section 3.4 of the Consent Decree - Remedial Action Plan (CD-RAP) in the case of the United States of America, *et al.* vs. Reilly Tar & Chemical Corporation, *et al.*, this report presents the results of all chemical analyses and water level measurements for calendar year 1992 that are not presented in previous reports.

The ground water monitoring conducted in 1992 was performed in accordance with the Sampling Plan submitted in October 1991. The City of St. Louis Park (City) has overall responsibility for conducting the ground water monitoring required by the CD-RAP. In accordance with the Sampling Plan, the City was assisted in 1992 by ENSR Consulting and Engineering (ENSR) who collected ground water samples from monitoring wells, and by Rocky Mountain Analytical Laboratory (RMAL) who performed the analyses for PAH and phenolics.

The 1992 monitoring data are presented separately for each aquifer that was monitored, starting with the Mt. Simon-Hinckley Aquifer, which is the deepest below the ground surface, and ending with the Drift Aquifer, which is the uppermost aquifer monitored. A series of maps has been prepared to help present the monitoring data. Maps for the Prairie du Chien-Jordan, St. Peter, Platteville and Drift Aquifers are contained in the pockets of this report.

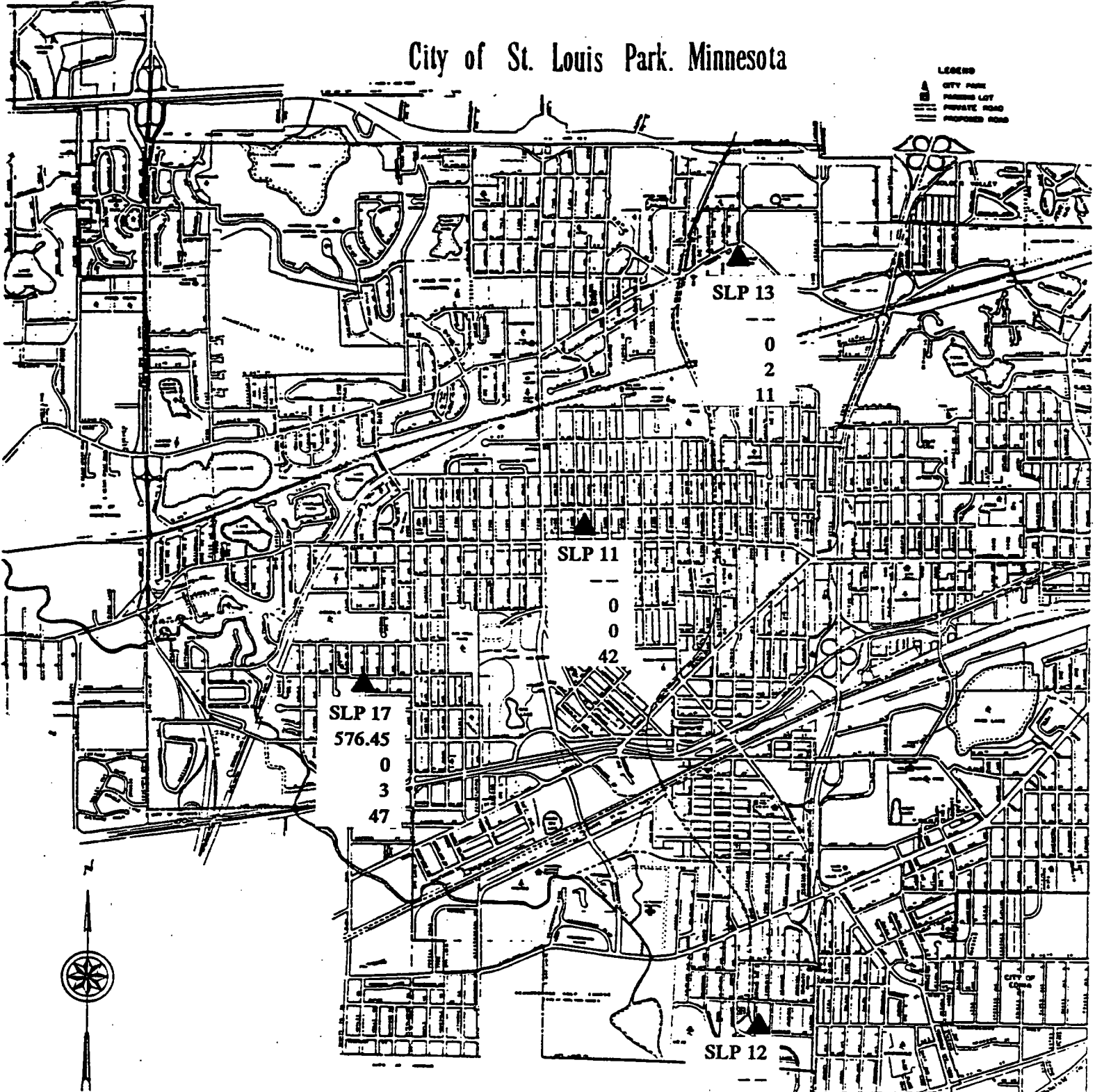
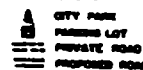
2.0 MT. SIMON-HINCKLEY AQUIFER

In accordance with RAP Section 5.1, four wells in the Mt. Simon-Hinckley Aquifer were sampled once in 1992. A summary of the analytical data and the water level elevations at the four wells are shown on Figure 2-1. The laboratory reports of the analytical data are included as Appendix A.

The sums of the concentrations of benzo(a)pyrene and dibenz(a,h)anthracene PAH, carcinogenic PAH, and other PAH in each well are below the drinking water criteria for these compounds. The results for all four wells are consistent with historical water quality for the aquifer. It appears that the Mt. Simon-Hinckley Aquifer has not been significantly affected by contaminants originating from the former Reilly Tar & Chemical (Reilly) site.

City of St. Louis Park, Minnesota

LEGEND



KEY



Well Location

Water Level

Sum of benzo(a) pyrene and dibenz(a,h) anthracene

Total Carcinogenic PAH

Total Other PAH

Concentration units in ppt

Scale in Feet



Figure 2-1
Summary of Ground Water Monitoring Results
for the Mt. Simon-Hinckley Aquifer - 1992

3.0 IRONTON-GALESVILLE AQUIFER

Analytical results from ground water samples collected during 1987 through 1991 from well W105 had consistently met the criterion (less than 10 parts per billion [10,000 parts per trillion] total PAH) for discontinuing the 25 gallons per minute (gpm) pumping rate. Therefore, in accordance with CD-RAP Section 6.1.5, the pump in well W105 was inactivated on December 23, 1992.

Ground water samples were collected quarterly in 1992, as required by the CD-RAP during the first year after cessation of pumping in well W105; however, due to mechanical problems, a ground water sample was not collected in the third quarter.

Ground water analytical results from the first two quarters reveal total PAH concentrations of 2185 and 5412 parts per trillion (ppt) which are consistent with previous sampling events. However, fourth quarter analytical results revealed a total PAH concentration of 29,900 ppt which exceeds the 10,000 ppt criteria. Therefore, in accordance with CD-RAP Section 6.1.5, two additional samples were collected within one month of the fourth quarter result. Analytical results from these two additional sampling events both revealed total PAH concentrations below the 10,000 ppt criteria. Therefore, the pump in well W105 will not be reactivated.

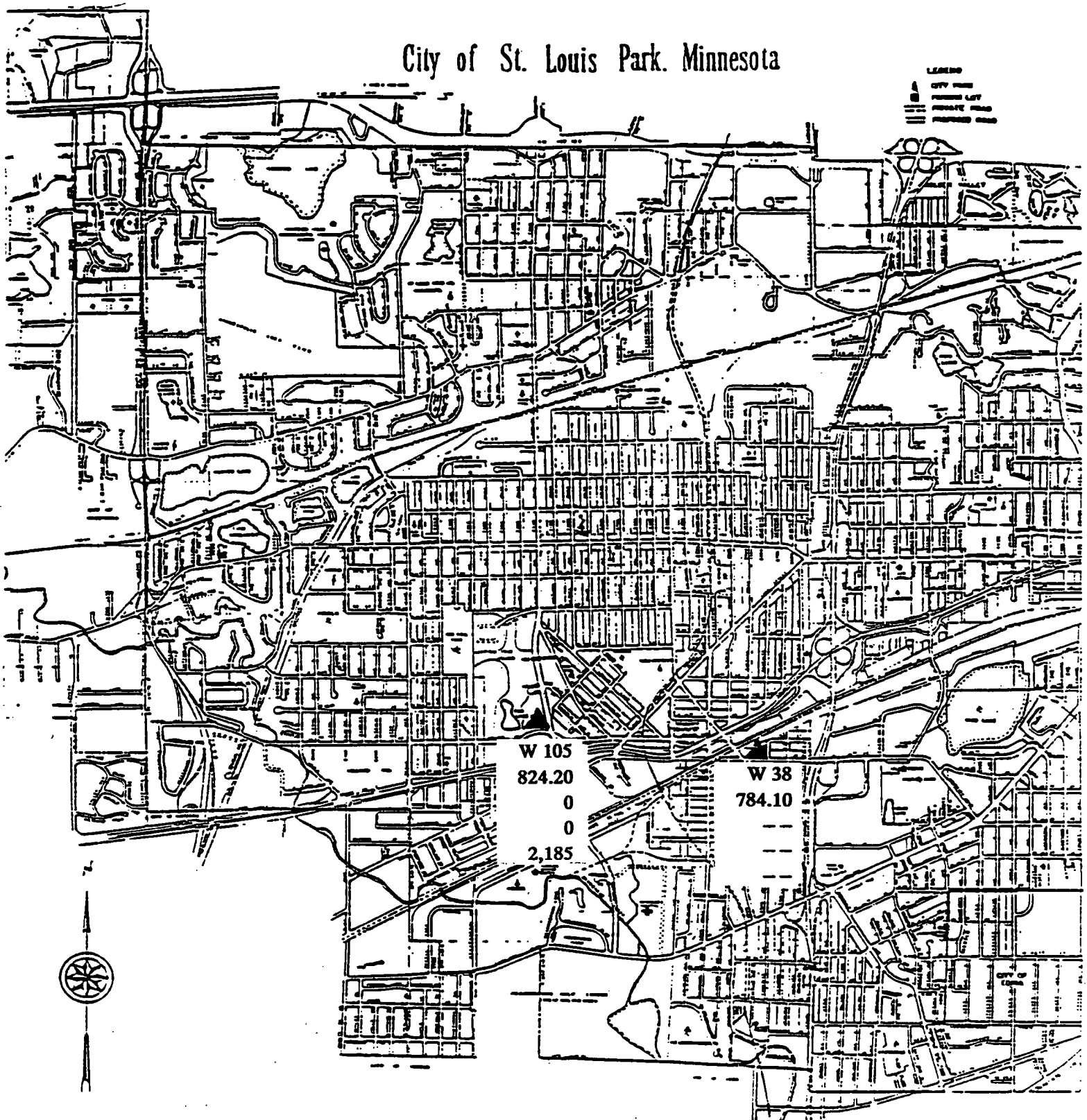
Analytical results from the three quarterly sampling events as well as the two additional sampling events are provided in Appendix B and presented in Table 3-1. Water quality results from the first and second quarter 1992 and first quarter 1993 sampling events are presented in Figures 3-1, 3-2, and 3-3, respectively.

TABLE 3-1**Summary of Total PAH in Well W105
1988 to 1992**

Sampling Date	PAH (ng/ℓ)
February 1988	9000
June 1988	2400
September 1988	3670
December 1988	2035
June 1989	1400
December 1989	1086
March 1990	2347
August 1990	2600
May 1991	2164
August 1991	1014
February 1992	2185
June 1992	5412
November 1992	29,900
January 11, 1993 ¹	1649
January 19, 1993 ¹	1379

1. Additional samples required per CD-RAP Section 6.1.5

City of St. Louis Park, Minnesota



KEY



Well Location

Water Level

Sum of benzo(a) pyrene and dibenz(a,h) anthracene

Total Carcinogenic PAH

Total Other PAH

Concentration units in ppt

Scale in Feet

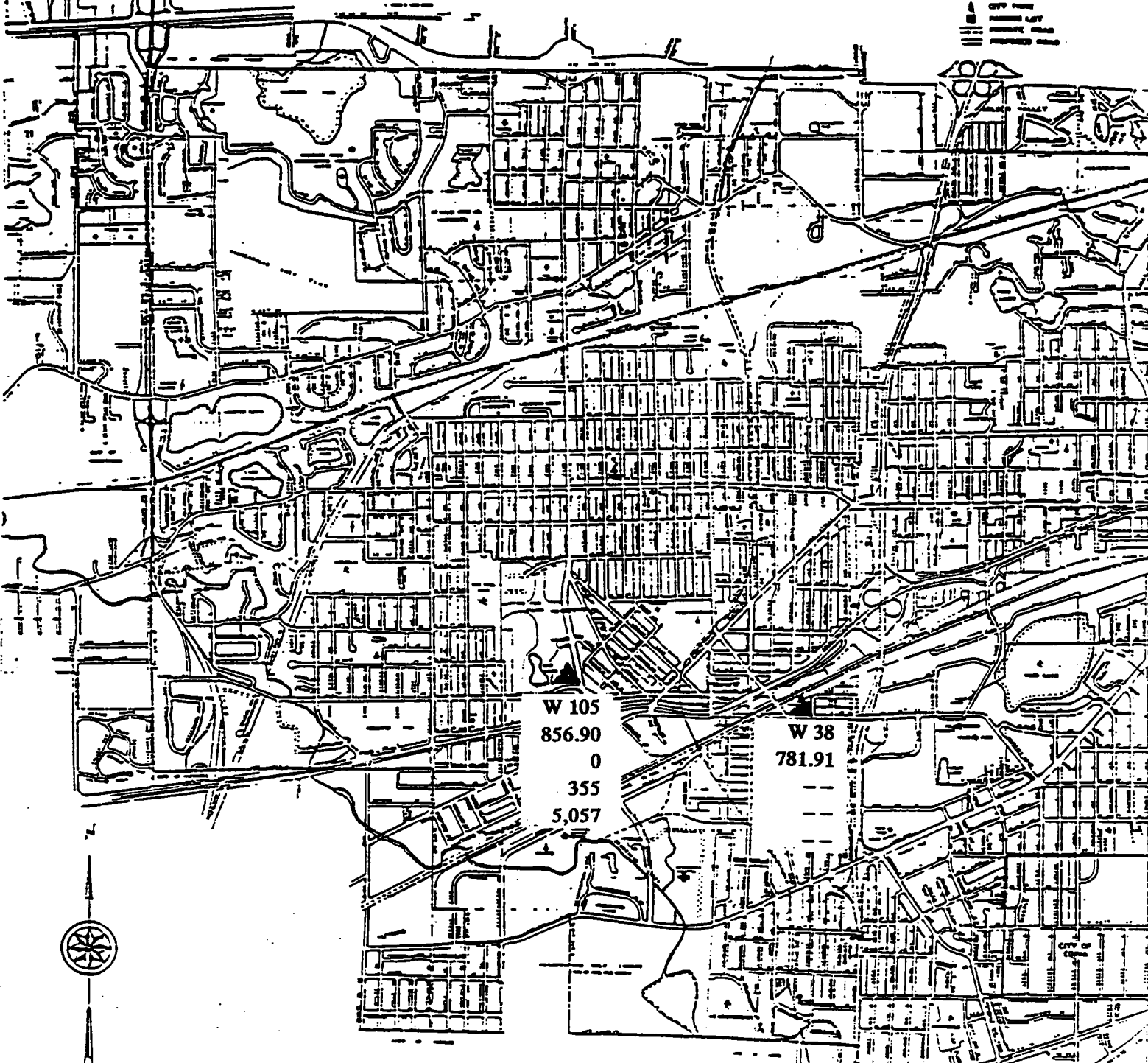
0 1000 2000 3000

Figure 3-1

Summary of Ground Water Monitoring Results for
the Ironton-Galesville Aquifer - First Quarter 1992

City of St. Louis Park, Minnesota

LEGEND
 CITY PARK
 PRIVATE LOT
 PUBLIC LOT



KEY



Well Location

Water Level

Sum of benzo(a) pyrene and dibenz(a,h) anthracene

Total Carcinogenic PAH

Total Other PAH

Concentration units in ppt

Scale in Feet

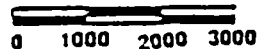





Figure 3-2
 Summary of Ground Water Monitoring Results for
 the Ironton-Galesville Aquifer - Second Quarter 1992

City of St. Louis Park, Minnesota

LEGEND
 CITY WATER
 PRIVATE LOT
 PRIVATE ROAD



W 105

0

0

1649

W 38

Scale in Feet

0 1000 2000 3000

KEY



Well Location

Water Level

Sum of benzo(a) pyrene and dibenz(a,h) anthracene

Total Carcinogenic PAH

Total Other PAH

Concentration units in ppt

Figure 3-3

Summary of Ground Water Monitoring Results for
 the Iron-ton-Galesville Aquifer - First Quarter 1993

4.0 PRAIRIE DU CHIEN-JORDAN AQUIFER

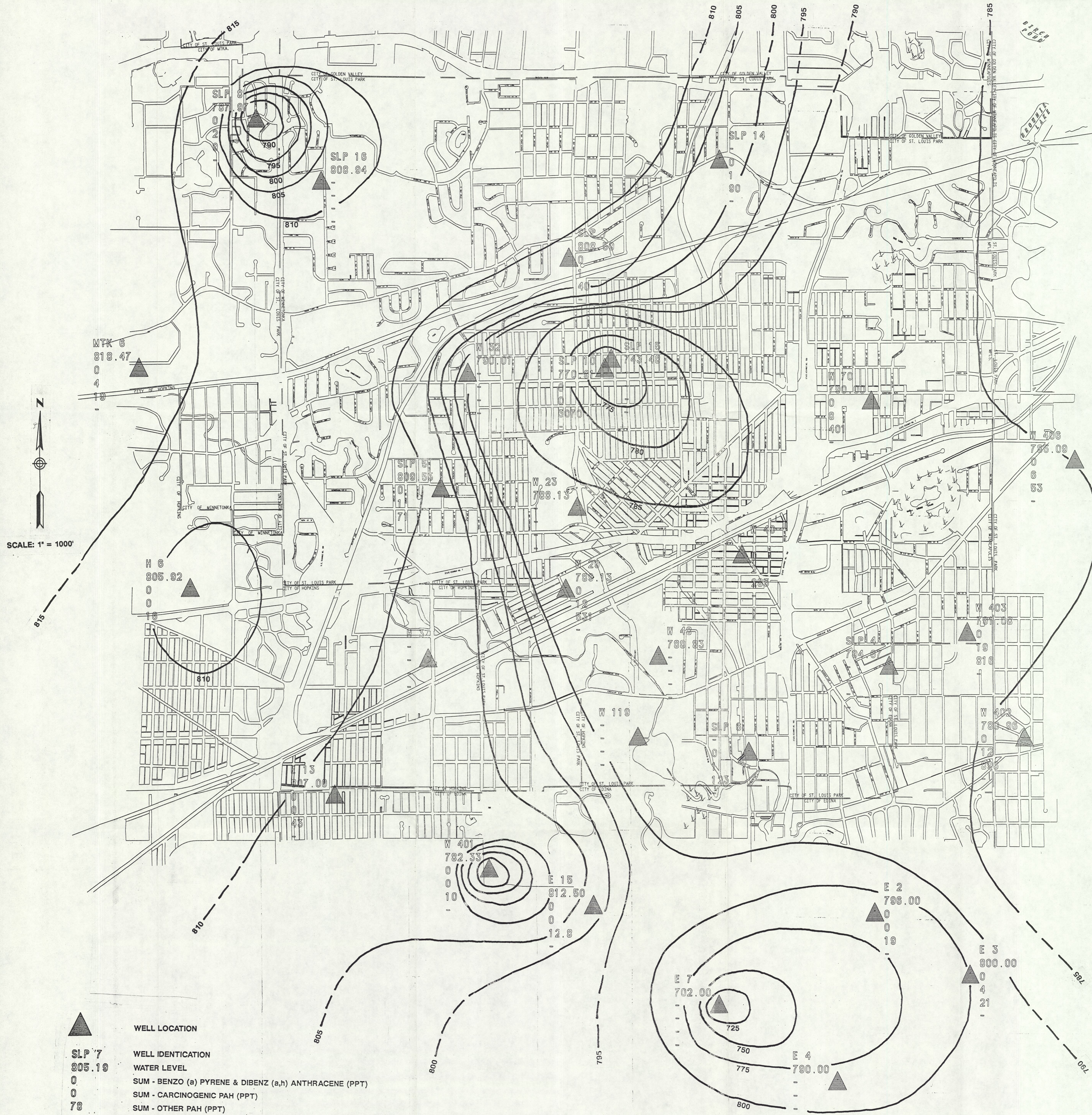
In accordance with RAP Section 7.3, Prairie du Chien-Jordan Aquifer wells were monitored twice in 1992, per the frequency outlined in the 1992 Sampling Plan. In addition to water quality monitoring, ground water elevations were measured at the Prairie du Chien-Jordan Aquifer wells during each sampling round. Wells W119, W48, and H3 were omitted from sampling during 1992 because owners have taken these wells out of service. A total of 23 wells were monitored during 1992.

Summaries of analytical data and ground water elevations for the sampling rounds are shown in Figures 4-1 and 4-2 (in pocket). These two figures indicate that ground water flow in the aquifer is greatly affected by the pumping of wells and is dependent upon the pumping rate and the time the specific measurements were recorded (e.g., pump may have been recently shut off, or turned on). Laboratory reports of the monitoring are presented in Appendix C. Table 4-1 presents a summary of 1989 through 1992 analytical results for Prairie du Chien-Jordan Aquifer wells. In 1992, Other PAH were detected in concentrations ranging from 9 ppt (SLP8) to 67,000 ppt (well W23). A total of eight wells exceed the drinking water criterion for other PAH (W23, SLP10, SLP15, W402, W403, W29, W40, and W70).

The levels of total carcinogenic PAH detected range from below detectable levels to 19 ppt, which is below the drinking water criteria of 28 ppt.

The results for wells W402 and W403 exceeded the drinking water criteria for PAH. Other monitoring wells between the Reilly site and wells W402 and W403 exhibit PAH levels below the drinking water criteria (e.g., see historical data for wells SLP4 and SLP6 on Table 4-1). It is not known if the PAH in wells W402 and W403 are related to contamination from the Reilly site.

Ground water analytical results from 1992 revealed PAH concentrations of less than 1 part per billion (ppb) in samples collected from well W402 and well W403. Ground water samples collected from these two wells (W402 and W403) during the third quarter of 1991 revealed PAH concentrations much higher than 1 ppb. Historical and current ground water quality data for these two wells indicate PAH concentrations of less than 1 ppb. Therefore, the water quality results obtained during the third quarter of 1991 may not have been indicative of the true ground water quality but may have been impacted from extraneous sources such as vandalism. Vandalism of these wells was discussed in the Annual Monitoring Report for 1991.



Summary of Total PAH Analytical Results for Prairie du Chien-Jordan Aquifer Wells 1989 through 1992^a

[illegible]

TABLE 4-1

Summary of Total PAH Analytical Results
for Prairie du Chien-Jordan Aquifer Wells
1989 through 1992^a

Well	1989				1990				1991				1992			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
SLP5	-	94	-	-	-	48	-	-	-	43	-	-	-	72	-	-
H6	-	16	-	-	-	14	-	-	-	15.5	-	-	-	16	-	-
E3	-	15	-	-	-	18	-	-	-	-	13.3	-	-	25	-	-
E15	-	16	-	-	-	11	-	-	-	12.8	-	-	-	23	-	-
MTKA6	-	12	-	-	-	27	-	-	-	17	-	-	-	23	-	-
W29	-	341	-	-	-	376	-	-	-	410.6	-	-	-	543	-	-
W40	-	540	-	-	-	721	-	-	-	479.5	-	-	-	285	-	-
W70	-	431	280	-	-	569	-	-	-	676	-	-	-	409	-	-
W401	-	15	-	-	-	27	-	-	-	27.6	-	-	-	10	-	-
SLP4	-	-	-	232	210	241	-	-	-	-	-	-	-	-	-	312
SLP8	-	-	-	-	15	-	-	-	50.1	-	-	-	-	11	-	20

a. Results presented are the sum of carcinogenic and other PAH in parts per trillion (ng/l)

b. - Signifies the well was not sampled

5.0 ST. PETER AQUIFER

In accordance with the 1992 Sampling Plan, the St. Peter Aquifer wells were monitored twice in 1992. In addition to water quality monitoring, ground water elevations were measured in the St. Peter Aquifer wells during each monitoring round. Summaries of analytical data and ground water elevations for the first half and second half of 1992 are shown in Figures 5-1 and 5-2 (in pocket). Laboratory results of the monitoring are provided in Appendix D.

A summary of total PAH results for 1989, 1990, 1991, and 1992 is presented in Table 5-1. The data in Table 5-1 show several trends. Total PAH concentrations have remained relatively stable for wells SLP3, W122, W129, W411, W412, W408, and P116. Wells W33 and W24 contain relatively high levels of total PAH, consistent with historical data (pre-1989) and their proximity to the central portion of the contaminated area in the St. Peter Aquifer.

Well W133 has exhibited a decrease in total PAH concentrations by an order of magnitude during the 1991 and 1992 sampling events when compared to the 1989 and 1990 sampling events. The trend in the last two years reveals a decrease in total PAH concentrations except for a slight increase during the second round of 1991.

Ground water samples collected from wells W409 and W410 exhibit total PAH concentrations increasing by more than an order of magnitude when compared to previous years' analytical data. Analytical results from well W409 reveal a total PAH concentration of 49,660 and 49,399 ppt in ground water samples collected during the first half and second half of 1992, respectively. Well W409 is apparently being impacted by PAH sources at the Reilly site that are flowing to well W409 in response to pumping well W410.

The increase in total PAH concentration at well W410 is probably explained by the operation of this well to control the hydraulic gradient in the St. Peter Aquifer. This well is expected to control the flow of ground water through the area of the aquifer represented by the water quality in wells such as W33 and W24.

In conclusion, the 1992 sampling results for the St. Peter Aquifer appear to accurately represent water quality conditions in the aquifer. The operation of well W410 does appear to be effective in controlling the flow of ground water as evidenced by the 1992 water quality changes, and the water level contours shown in Figures 5-1 and 5-2. Continued monitoring in accordance with the 1993 Sampling Plan will allow continued evaluation of water quality in the St. Peter Aquifer.

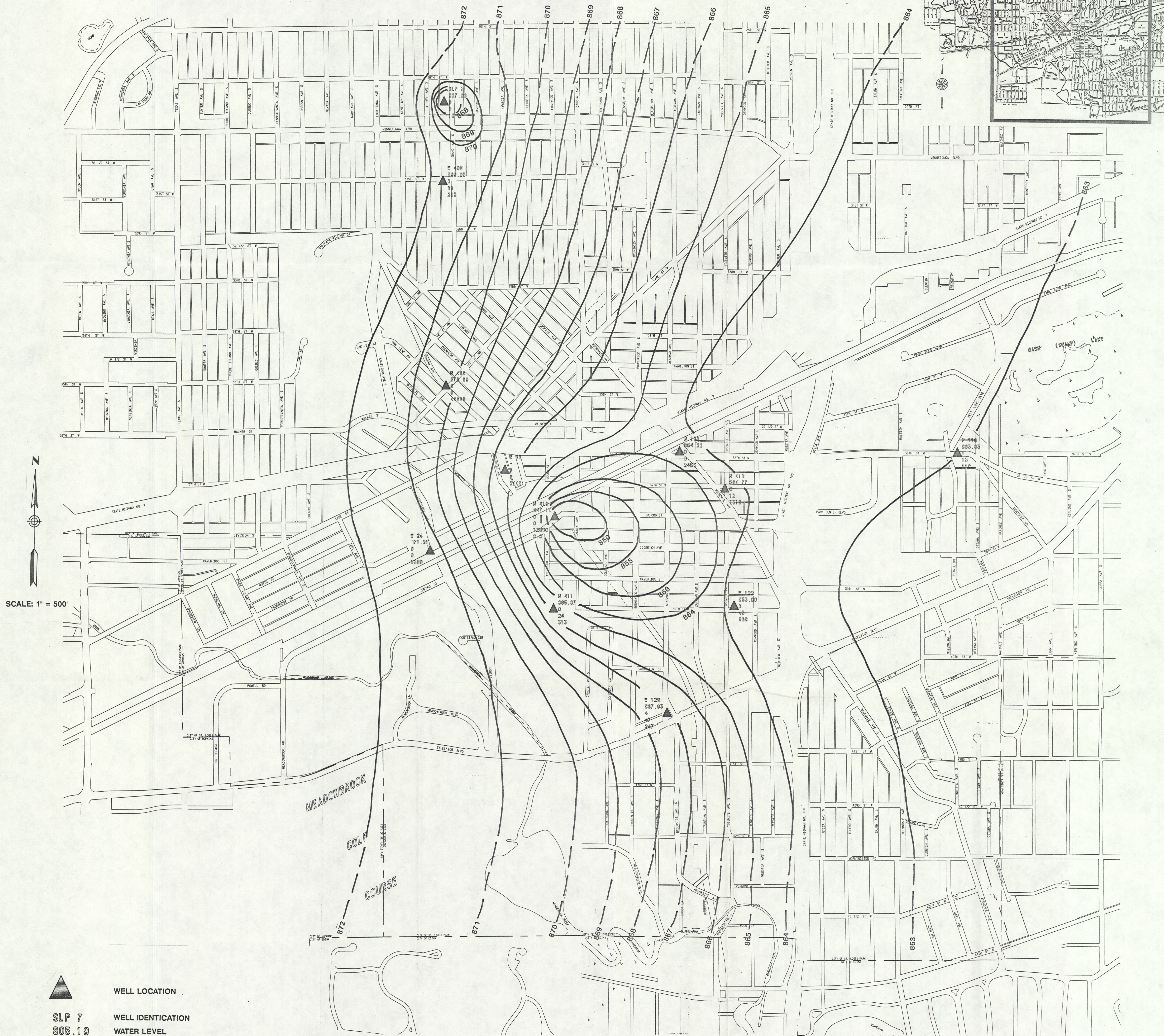


FIGURE 5 - 1 SUMMARY OF GROUND WATER MONITORING RESULTS FOR THE ST. PETER AQUIFER: FIRST HALF, 1992

SCALE: 1" = 500'

SLP 7
805 19
0
0
78

WELL LOCATION

WELL IDENTIFICATION

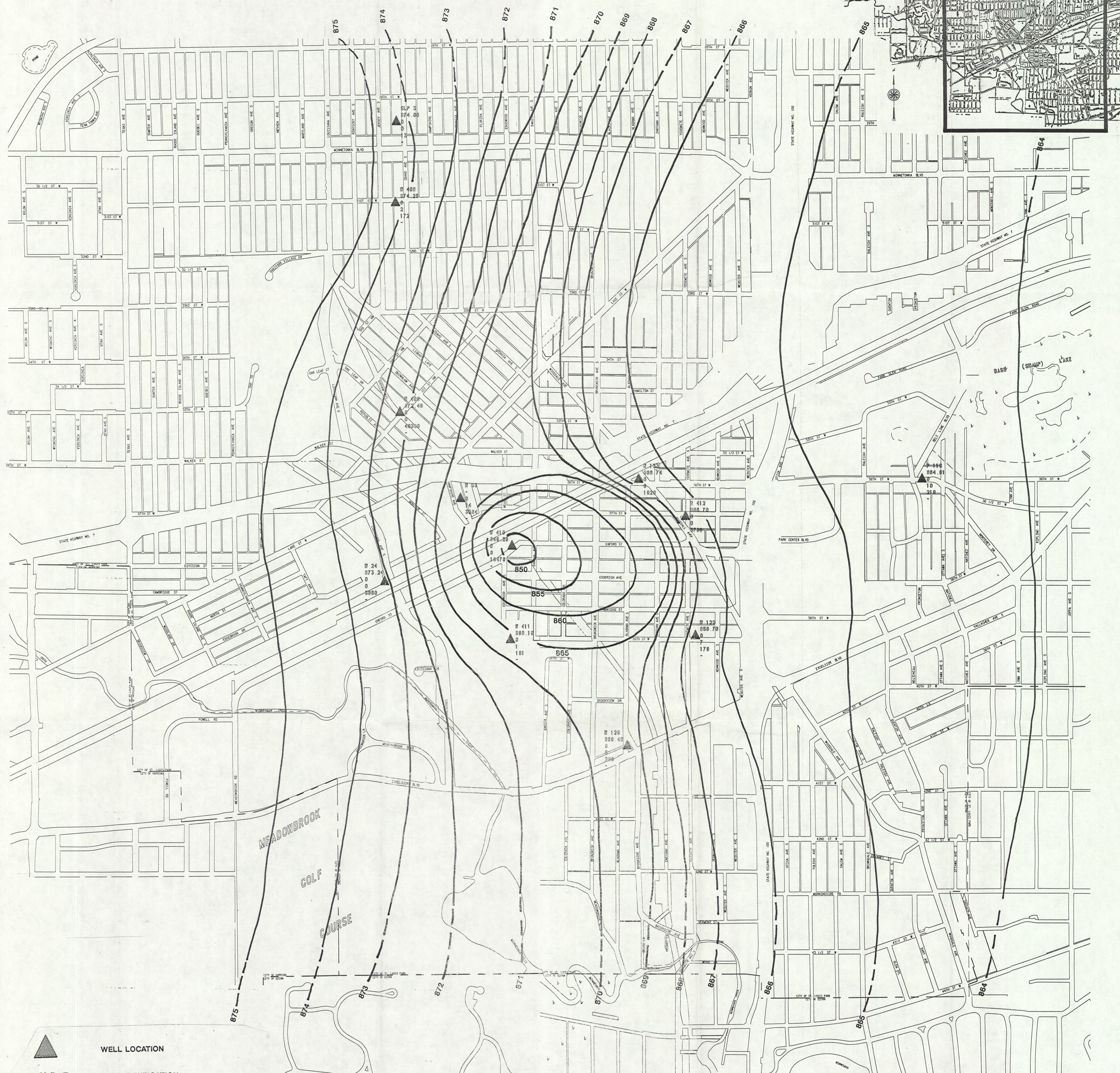
WATER LEVEL

SUM - BENZO (a) PYRENE & DIBENZ (a,h) ANTHRACENE (PPT)

SUM - CARCINOGENIC PAH (PPT)

SUM - OTHER PAH (PPT)

FIGURE 5 - 2 SUMMARY OF GROUND WATER MONITORING RESULTS FOR THE ST. PETER AQUIFER: SECOND HALF, 1992



City of St. Louis Park, Minnesota
JUNE 1997

AREA SHOWN AT EXPANDED SCALE

TABLE 5-1

**Summary of Total PAH Analytical Results
St. Peter Aquifer Wells
1989 through 1992^a**

Well	1989		1990		1991		1992	
	H1 ^b June	H2 October	H1 June	H2 August	H1 April	H2 August	H1 June	H2 November
SLP3	9.6	15	33	19	- ^c	24	16	13
W24	-	-	-	-	4023	4160	3380	3650
W33	-	-	-	290	17,912	9921	3448	3318
W122	163	2246	990	133	796	863	614	186
W129	601	40	143	96	190	430	298	301
W133	37,870	21,370	19,448	14,030	2591	4610	2453	1920
W408	150	110	24	158	358	1188	318	174
W409	630	830	141	243	360	3833	49,660	49,399
W411	208	460	466	336	408	251	337	182
W412	226	130	-	485	1524	5283	1331	3796
P116	83	43	-	22	61	42	132	229
W410	425	360	-	-	85	5330	14,910 ^d	16,470

- a. Results presented are the sum of carcinogenic PAH and other PAH in parts per trillion (ng/l)
b. H1 = First half; H2 = Second half
c. - Signifies not sampled
d. W410 was sampled twice in H1 1992. The second result indicates a level of 12,850 ng/l total PAH

6.0 DRIFT-PLATTEVILLE AQUIFER

6.1 Drift-Platteville Aquifer Source and Gradient Control Wells

Ground water monitoring for the Drift-Platteville Aquifer in 1992 included quarterly PAH and phenolics monitoring of wells W420 and W422, the Drift Aquifer source and gradient control wells, and W421, the Platteville Aquifer source control well. Wells W420, W421, and W422 have been monitored quarterly since they began pumping in 1987. The monitoring data are presented on Figures 6-1, 6-2, 6-3, and 6-4. The laboratory reports of the analytical data are included in Appendix E.

The PAH and phenolic data for wells W420, W421, and W422 are summarized in Table 6-1. Table 6-1 shows that near the source of contamination, PAH concentrations in ground water are consistently in the range of several hundred micrograms per liter to low milligrams per liter. The trends of these data suggest that while contaminant levels have fluctuated approximately 10 percent in the past three years, the overall levels can be described as stable.

6.2 Drift-Platteville Aquifer Monitoring

Ground water monitoring for 25 Drift-Platteville Aquifer monitoring wells in 1992 consisted of one round of sample collection and analysis for PAH and phenolics, and water level measurements. These 25 monitoring wells included 20 wells required to be sampled per the CD-RAP, plus an additional 5 monitoring wells. The laboratory reports for this analytical data were previously submitted in *Technical Memorandum - Hydrogeologic Investigation, Northern Area Platteville Aquifer*, dated May 20, 1992. However, for completeness of this Annual Monitoring Report, the analytical data and water table measurements are discussed below.

Figure 6-5 (in pocket) shows the results from the monitoring round for the Platteville Aquifer, and Figure 6-6 (in pocket) presents Drift Aquifer results. These two figures are contained in the pockets.

The water level contours in Figures 6-5 and 6-6 show the influence of the Drift-Platteville Aquifer source and gradient control wells on the regional east-southeast ground water flow direction. Figure 6-5 shows water level contours in the Platteville Aquifer monitoring wells that reflect the influence of the Platteville Aquifer source control well (W421). Well W421 is currently being pumped at a rate of 25 gpm, in accordance with the CD-RAP, and appears to be effective in controlling ground water in an area at least the size of the bog between Walker and Lake Streets.

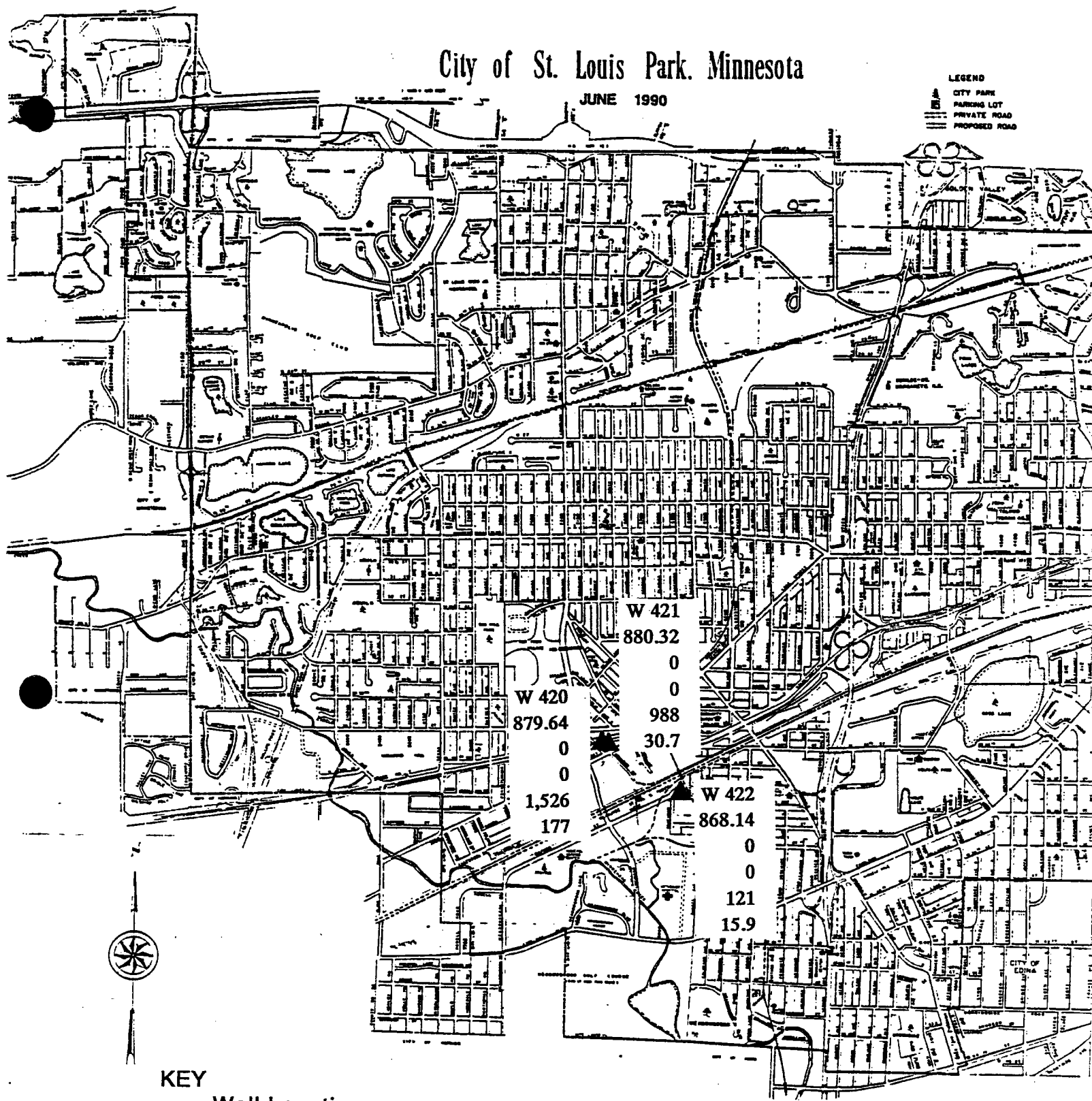
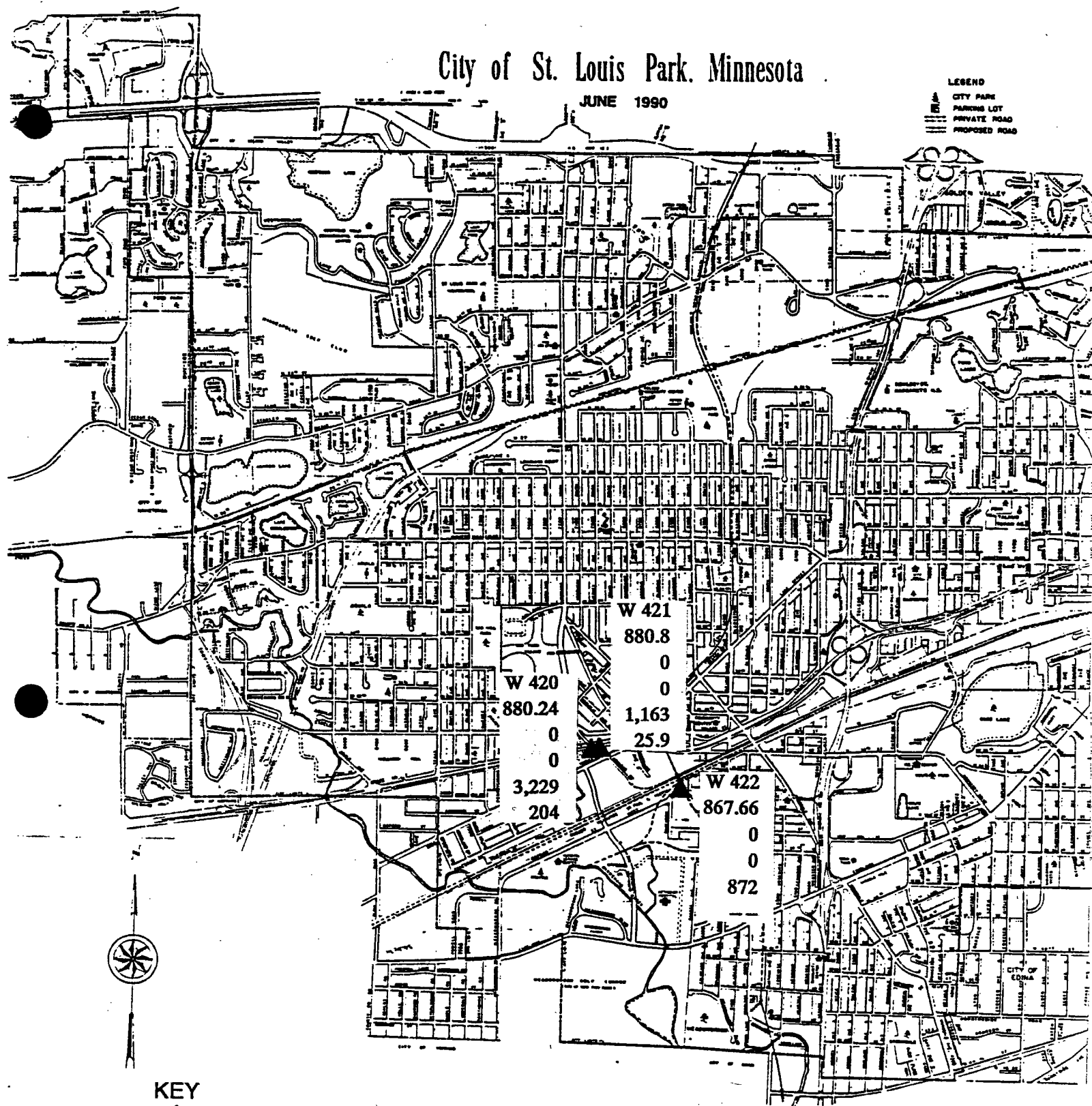


Figure 6-1
Summary of Ground Water Monitoring Results for the Drift-Platteville Aquifer
(Wells W420, W421, W422) – First Quarter 1992



KEY

- ▲ Well Location
- Water Level
- Sum of benzo(a) pyrene and dibenz(a,h) anthracene
- Total Carcinogenic PAH
- Total Other PAH
- Phenolics

Concentration units in ppb

Figure 6-2
Summary of Ground Water Monitoring Results for the Drift-Platteville Aquifer
(Wells W420, W421, W422) – Second Quarter 1992

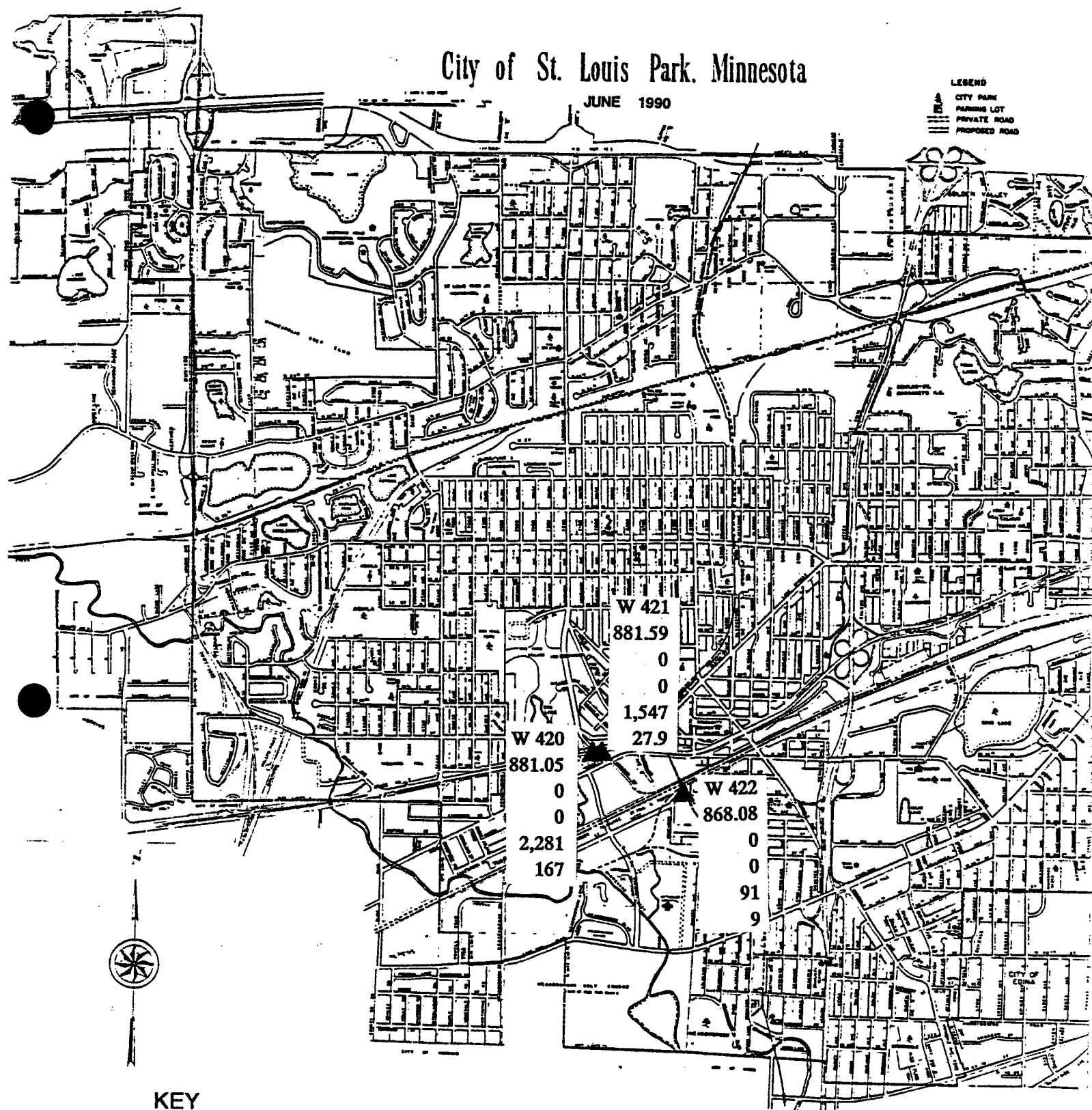
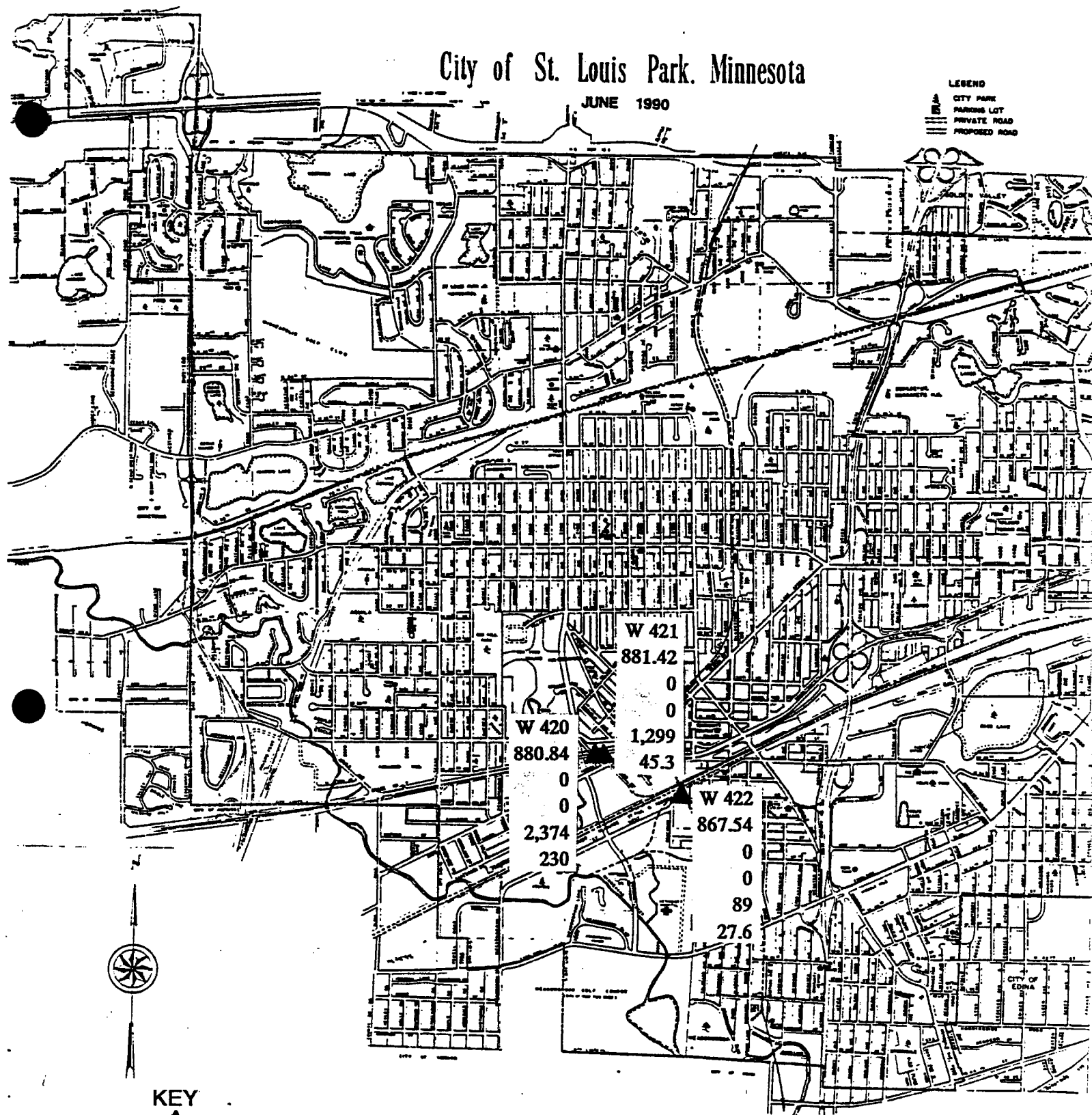


Figure 6-3
 Summary of Ground Water Monitoring Results for the Drift-Platteville Aquifer
 (Wells W420, W421, W422) – Third Quarter 1992



KEY

▲ Well Location

Water Level

Sum of benzo(a) pyrene and dibenz(a,h) anthracene

Total Carcinogenic PAH

Total Other PAH

Phenolics

Concentration units in ppb

Figure 6-4
Summary of Ground Water Monitoring Results for the Drift-Platteville Aquifer
(Wells W420, W421, W422) – Fourth Quarter 1992

TABLE 6-1

**Summary of Analytical Results for
Wells W420, W421 and W422
1988 through 1992**

Date	Total PAH^a ($\mu\text{g}/\ell$)	Phenols ($\mu\text{g}/\ell$)
W420		
August 1988	4200	200
October 1988	1100	44
March 1989	2400	120
June 1989	3400	130
September 1989	3400	220
December 1989	3400	110
March 1990	3950	240
May 1990	2430	230
August 1990	3150	245
December 1990	3030	230
March 1991	4200	230
June 1991	2500	220
September 1991	5000	210
October 1991	4200	190
February 1992	1526	177
June 1992	3229	204
September 1992	2281	167
October 1992	2374	236
W421		
August 1988	760	300
October 1988	1100	35
March 1989	880	30
June 1989	1000	30
September 1989	1000	35
December 1989	730	30
March 1990	1420	35
May 1990	715	30
August 1990	1410	40
December 1990	1145	30
March 1991	1400	30
June 1991	1400	31

TABLE 6-1

**Summary of Analytical Results for
Wells W420, W421 and W422
1988 through 1992**

Date	Total PAH^a ($\mu\text{g}/\ell$)	Phenols ($\mu\text{g}/\ell$)
September 1991	1200	27
October 1991	1300	30
February 1992	988	31
June 1992	1163	26
September 1992	1547	28
October 1992	1299	45
W422		
August 1988	77	24
October 1988	50	14
March 1989	50	10
June 1989	50	15
September 1989	60	20
December 1989	50	15
March 1990	75	20
May 1990	60	15
August 1990	90	15
December 1990	60	20
April 1991	59	^b
September 1991	-	17
October 1991	88	18
February 1992	121	16
June 1992	872	-
September 1992	91	9
October 1992	89	28

a. Total PAH is the sum of carcinogenic PAH and other PAH

b. Signifies not sampled

The Platteville Aquifer water level contours shown in Figure 6-5 support the interpretation that well W421 is an effective source control well.

Figure 6-6 shows Drift Aquifer water level contours in the bog area between Walker and Lake Streets that support the interpretation that the Drift Aquifer source control well (W420) is effective in controlling the flow of ground water in an area at least the size of the bog.

Figure 6-6 also shows a significant degree of control exerted on the ground water in the vicinity of the Drift-Platteville Aquifer gradient control well (W422). Well W422 currently is being pumped at a rate of approximately 50 gpm and appears to be effective in controlling ground water over a large portion of the Drift-Platteville Aquifer.

The water quality data shown on Figures 6-5 and 6-6 indicate a pattern of contamination in the Drift-Platteville Aquifer that is consistent with historical observations. During 1992, it appears that the Drift-Platteville Aquifer source and gradient control wells remained effective in controlling the spread of contamination in most of the vicinity of the Reilly site. Figure 6-7 presents the inferred area of contamination based on the 1992 data, and on historical water quality data for the aquifer. Based on studies that have taken place in the Northern Area of the Drift Aquifer, a United States Environmental Protection Agency (U.S. EPA) Record of Decision will direct a new pumping well in the Drift Aquifer to augment the gradient control provided by well W422. The new well will ensure gradient control in the Northern Area of the Drift Aquifer.

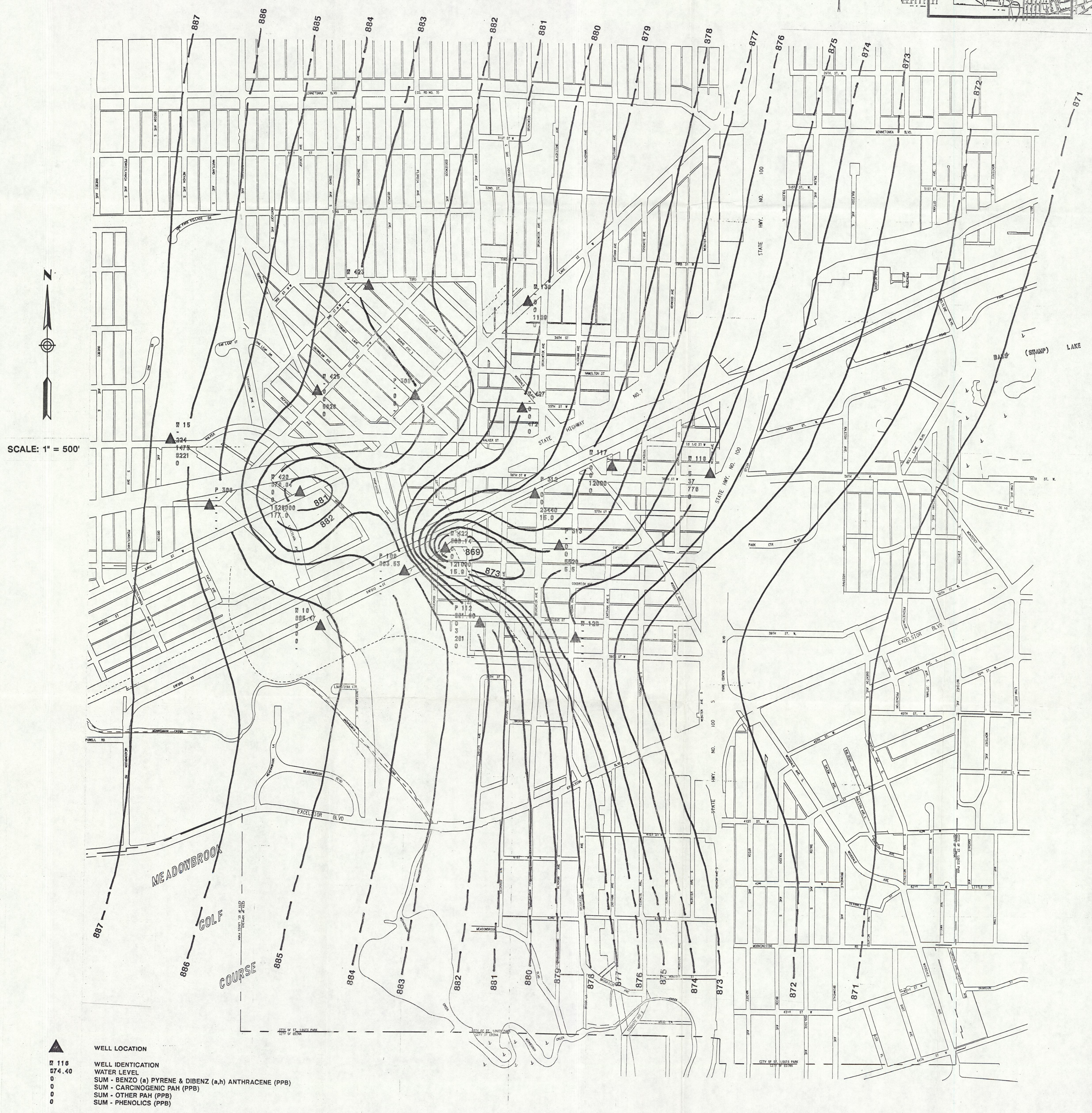
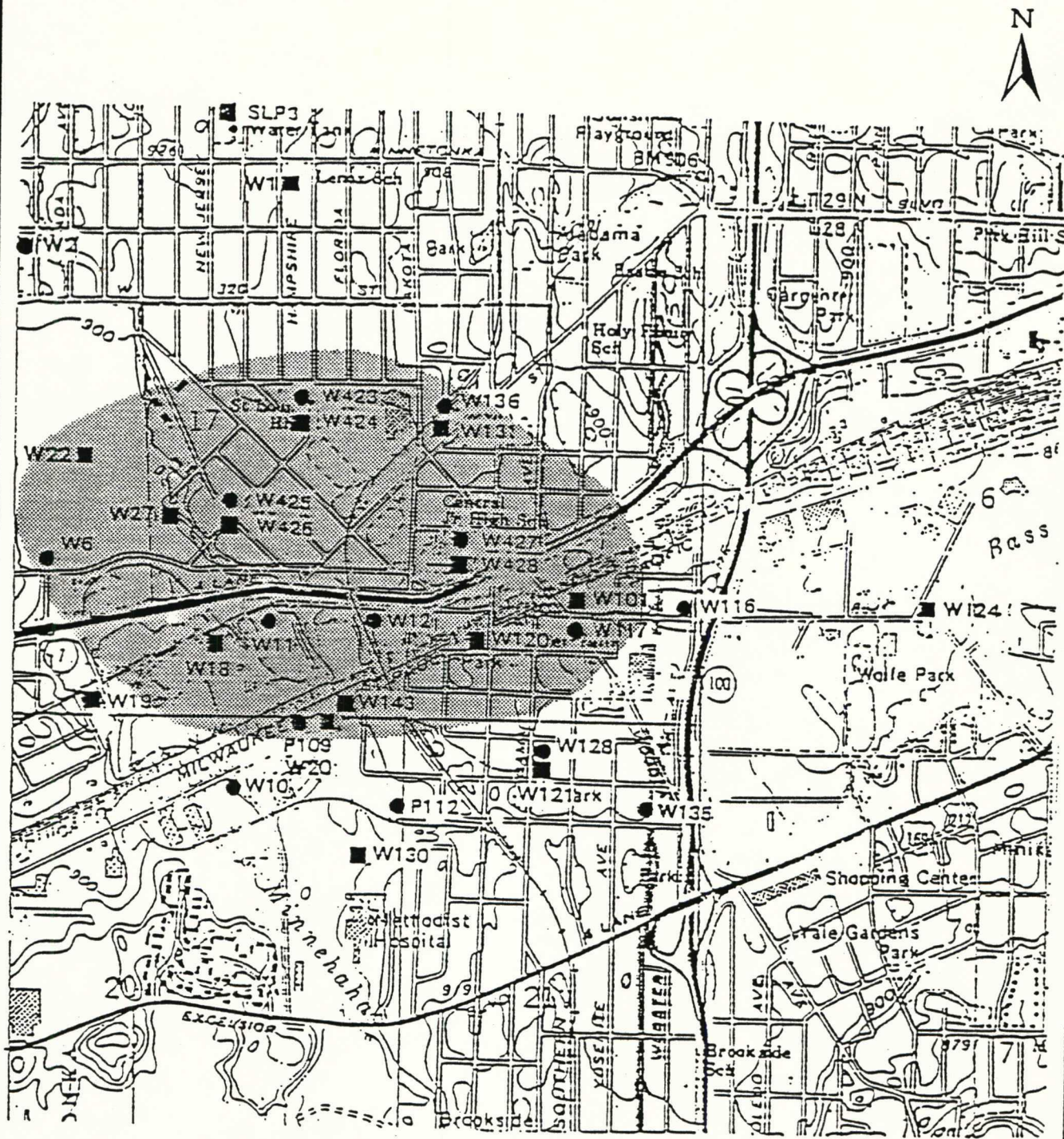


FIGURE 6 - 3 SUMMARY OF GROUND WATER MONITORING RESULTS FOR THE DRIFT AQUIFER: 1992



SCALE 0 500 1000 2000
FEET

Explanation

- Drift Wells
- Platteville Wells
- Inferred Area Of Contamination

Figure 6-7
Inferred Area of Contamination
in the Drift-Platteville Aquifer: 1992

APPENDIX A

**LABORATORY DATA SUMMARY PACKAGE:
MT. SIMON-HINCKLEY AQUIFER**

CITY OF ST. LOUIS PARK

Mount Simon Hinckley Aquifer 1992 PAH Quality Control Summary

Well No.	Sample Date	Method Blank	Field Duplicate	Matrix Spike	Matrix Spike Dup.	Field Blank
----------	-------------	--------------	-----------------	--------------	-------------------	-------------

RAP Section 5.1

SLP11	05/11/92	22702-BLK-01	PCJ-SLP8D-051192	PCJ-SLP8MS-051192	PCJ-SLP8MSD-051192	PCJ-SLP8-051192
SLP13	05/11/92	22702-BLK-01	PCJ-SLP8D-051192	PCJ-SLP8MS-051192	PCJ-SLP8MSD-051192	PCJ-SLP8FB-051192
SLP12	06/22/92	23478-BLK-01	PCJ-SLP5D-062292	PCJ-SLP5MS-062292	PCJ-SLP5MSD-062292	PCJ-SLP5FB-062292
SLP17	11/30/92	26507-BLK-03	GAC-SLP4TD-113092	GAC-SLP4MS-113092	GAC-SLP4MSD-113092	GAC-SLP4FB-113092



CASE NARRATIVE

FOR

City of St. Louis Park

June 12, 1992

Enseco - RMAL Project Number 022702

Introduction

Twelve aqueous samples (includes QC) were received at Enseco Rocky Mountain Analytical Laboratory on May 11, 1992. The samples were logged in under RMAL project number 022702. Sample PCJ-SLP8FBD-051192 was extracted and held per the April 1990 QAPP. A cross reference associating the RMAL sample numbers to the actual field sample numbers is included. The samples were analyzed for medium level part-per-trillion (ppt) polynuclear aromatic hydrocarbons (PAH).

Data Quality Assessment

The results contained in this report were reviewed relative to data acceptance criteria as specified in the April, 1990 QAPP for completeness, precision, accuracy, representativeness and defensibility of the data. Unless otherwise stated below, no quality control problems or technical difficulties were encountered which would impact the interpretation or use of data in this report.

PPT PAH

Samples 22702-BLK01 and BLK03 showed a surrogate which exceeded the upper control limits. All instrument calibration, surrogate standard concentration, etc. were checked and found to be in control. It has been concluded that an interference specific to the surrogate is present which resulted in the high recoveries. This interference does not affect the quantitation of target components.

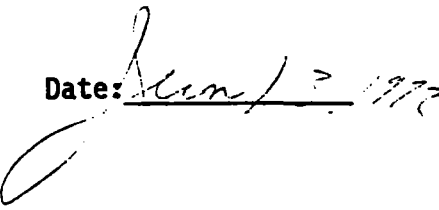
Case Narrative - RMAL #022702
June 12, 1992
Page Two

The 4800 ng/ml and the 2400 ng/ml standards had excessive saturation, therefore they were not used as the upper range for the 5-point calibration curve. Instead, the calibration curve used was, 20 ng/ml, 40 ng/ml, 240 ng/ml, 600 ng/ml, and 1200 ng/ml.

Samples 022702-01 thru 08, 07FB, 07DU, 07MS, 07SD, and the associated method blank for 05/13/92 extraction (BLK01), and the associated method blank for 05/14/92 extraction (BLK02), and the associated method blank for 05/15/92 extraction (BLK03), show target compounds that do not meet secondary ion confirmation. In some instances a compound that does not meet secondary ion confirmation criteria may still be determined to be present in the sample after close inspection of the data by the analyst. Supportive data includes mass chromatograms maxima at the same scan for primary and secondary ions, as well as discernible quantitation interference with the secondary ion. These compounds are flagged with the letter (R) on the data sheets (Form I) as per the 1990 QAPP.

This data package is in compliance with the terms and conditions of the 1990 QAPP, both technically and for completeness, for other than the conditions detailed above.

Reported by: 
Julieann L. Kramer
Program Administrator

Date:  6-17-92

Approved by: 
Mark Dymerski
Technical Manager

Date: 6-18-92

SAMPLE DESCRIPTION INFORMATION
 for
 City of St. Louis Park

Lab ID	Client ID	Matrix	Sampled Date	Received Date
022702-0001-SA	MSH-SLP11-051192 -	AQUEOUS	11 MAY 92	12 MAY 92
022702-0002-SA	MSH-SLP13-051192 ✓	AQUEOUS	11 MAY 92	12 MAY 92
022702-0003-SA	PCJ-W40-051192 ✓	AQUEOUS	11 MAY 92	12 MAY 92
022702-0004-SA	PCJ-E3-051192 ✓	AQUEOUS	11 MAY 92	12 MAY 92
022702-0005-SA	PCJ-MTK6-051192 ✓	AQUEOUS	11 MAY 92	12 MAY 92
022702-0006-SA	PCJ-W401-051192 ✓	AQUEOUS	11 MAY 92	12 MAY 92
022702-0007-SA	PCJ-SLP8-051192 ✓	AQUEOUS	11 MAY 92	12 MAY 92
022702-0007-DU	PCJ-SLP8D-051192	AQUEOUS	11 MAY 92	12 MAY 92
022702-0007-MS	PCJ-SLP8MS-051192	AQUEOUS	11 MAY 92	12 MAY 92
022702-0007-SD	PCJ-SLP8MSD-051192	AQUEOUS	11 MAY 92	12 MAY 92
022702-0007-FB	PCJ-SLP8FB-051192	AQUEOUS	11 MAY 92	12 MAY 92
022702-0007-FD	PCJ-SLP8FBD-051192	AQUEOUS	11 MAY 92	12 MAY 92
022702-0008-SA	PCJ-SLP14-051192 ✓	AQUEOUS	11 MAY 92	12 MAY 92

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FOR
CITY OF ST. LOUIS PARK
RMAL PROJECT# 022702

PPT-PAH

QC Summary.....	0001
Sample Data.....	0012
Standards Data.....	0521
Raw QC Data.....	0894



Qualifier Codes and Their Usage

- U** = Indicates compound was analyzed for but not detected. The sample quantitation limit must be corrected for dilution and for percent moisture. For example, 10 U for phenol in water if the sample final volume is the protocol-specified final volume. If a 1 to 10 dilution of extract is necessary, the reported limit is 100 U. For a soil sample, the value must also be adjusted for percent moisture.
- J** = Indicates an estimated value. This flag is used either when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed, or when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the sample quantitation limit but greater than zero. For example, if the sample quantitation limit is 10 ug/L, but a concentration of 3 ug/L is calculated, report it as 3J. The sample quantitation limit must be adjusted for dilution as discussed for the U flag.
- N** = Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds, where the identification is based on a mass spectral library search. It is applied to all TIC results.
- P** = This flag is used for a pesticide/Aroclor target analyte when there is greater than 25% difference for detected concentrations between the two GC columns (see Form X). The lower of the two values is reported on Form I and flagged with a "P".
- C** = This flag applies to pesticide results where the identification has been confirmed by GC/MS. If GC/MS confirmation was attempted but was unsuccessful, do not apply this flag, instead use a laboratory-defined flag, discussed below.
- B** = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action. This flag must be used for a TIC as well as for a positively identified target compound.



Qualifier Codes and Their Usage

Page Two

- E** = This flag identifies compounds whose concentrations exceed the calibration range of the GC/MS instrument for that specific analysis. If one or more compounds have a response greater than full scale, except as noted in Exhibit D, the sample or extract must be diluted and re-analyzed accordingly to the specifications in Exhibit D. All such compounds with a response greater than full scale should have the concentration flagged with an "E" on the Form I for the original analysis. If the dilution of the extract causes any compounds identified in the first analysis to be below the calibration range in the second analysis, then the results of both analyses shall be reported on separate copies of Form I. The Form I for the diluted sample shall have the "DL" suffix appended to the sample number. NOTE: For total xylenes, where three isomers are quantified as two peaks, the calibration range of each peak should be considered separately, e.g., a diluted analysis is not required for total xylenes unless the concentration of either peak separately exceeds 200 ug/L.
- D** = This flag identifies all compounds identified in an analysis at a secondary dilution factor. If a sample or extract is re-analyzed at a higher dilution factor, as in the "E" flag above, the "DL" suffix is appended to the sample number on the Form I for the diluted sample, and all concentration values reported on that Form I are flagged with the "D" flag. This flag alerts data users that any discrepancies between the concentrations reported may be due to dilution of the sample or extract.
- A** = This flag indicates that a TIC is a suspected aldol-condensation product.
- X** = Other specific flags may be required to properly define the results. If used, they must be fully described, and such description attached to the Sample Data Summary Package and the SDG Narrative. Begin by using "X". If more than one flag is required, use "Y" and "Z" as needed. If more than five qualifiers are required for a sample result, use the "X" flag to combine several flags, as needed. For instance, the "X" flag might combine the "A", "B", and "D" flags for some sample. The laboratory-defined flags are limited to the letters "X", "Y", and "Z".
- R** = Target compound's secondary ion confirmation criteria not met, but retention time and peak shape make identification possible.

1X
ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

22702-01

Name: ENSECO

Contract:

MSH-SLP11-051192

Lab Code: ENSECO

Case No.: 22702

SAS No.:

SDG No.:

Matrix: (soil/water) WATER

Lab Sample ID: 22702-01

Sample wt/vol: 4070 (g/mL) ML

Lab File ID: C5621

Level: (low/med) LOW

Date Received: 05/12/92

% Moisture: decanted: (Y/N) N

Date Extracted: 05/13/92

Concentrated Extract Volume: 500(uL)

Date Analyzed: 05/21/92

Injection Volume: 2.0(uL)

Dilution Factor: 0.123

GPC Cleanup: (Y/N) N pH: 7.0

CONCENTRATION UNITS:
(ng/L or ug/Kg) ng/L

Q

CAS NO.	COMPOUND		
271-89-6	2,3-Dibenzofuran	5	U
496-11-7	2,3-Dihydroindene	3	R
95-13-6	1H-Indene	3	
91-20-3	Naphthalene	22	B
4565-32-6	Benzo(B)Thiophene	1	R
91-22-5	Quinoline	1	U
120-72-9	1H-Indole	2	U
91-57-6	2-Methylnaphthalene	1	B
90-12-0	1-Methylnaphthalene	3	BR
92-52-4	Biphenyl	4	U
208-96-8	Acenaphthylene	1	U
83-32-9	Acenaphthene	2	
132-64-9	Dibenzofuran	1	U
86-73-7	Fluorene	1	
132-65-0	Dibenzothiophene	1	U
85-01-8	Phenanthrene	4	B
120-12-7	Anthracene	1	U
260-94-6	Acridine	3	U
86-74-8	Carbazole	1	JR
206-44-0	Fluoranthene	1	J
129-00-0	Pyrene	1	BJ
56-55-3	Benzo(A)Anthracene	2	U
218-01-9	Chrysene	3	U
205-99-2	Benzo(B)Fluoranthene	2	U
207-08-9	Benzo(K)Fluoranthene	2	U
192-97-2	Benzo(E)Pyrene	2	U
50-32-8	Benzo(A)Pyrene	2	U
198-55-0	Perylene	2	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2	U
53-70-3	Dibenz(A,H)Anthracene	2	U
191-24-2	Benzo(G,H,I)Perylene	3	U

1X
ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

22702-02

Name: ENSECO

Contract:

MSH-SLP13-051192

Lab Code: ENSECO

Case No.: 22702

SAS No.:

SDG No.:

Matrix: (soil/water) WATER

Lab Sample ID: 22702-02

Sample wt/vol: 4060 (g/mL) ML

Lab File ID: C5622

Level: (low/med) LOW

Date Received: 05/12/92

% Moisture: decanted: (Y/N) N

Date Extracted: 05/13/92

Concentrated Extract Volume: 500(uL)

Date Analyzed: 05/21/92

Injection Volume: 2.0(uL)

Dilution Factor: 0.123

GPC Cleanup: (Y/N) N pH: 7.0

CONCENTRATION UNITS:
(ng/L or ug/Kg) ng/L

Q

CAS NO.	COMPOUND		
271-89-6	2,3-Dibenzofuran	5	U
496-11-7	2,3-Dihydroindene	1	U
95-13-6	1H-Indene	0.9	U
91-20-3	Naphthalene	2	BJ
4565-32-6	Benzo(B)Thiophene	0.9	U
91-22-5	Quinoline	1	U
120-72-9	1H-Indole	2	U
91-57-6	2-Methylnaphthalene	2	BR
90-12-0	1-Methylnaphthalene	1	BJR
92-52-4	Biphenyl	4	U
208-96-8	Acenaphthylene	1	U
83-32-9	Acenaphthene	1	U
132-64-9	Dibenzofuran	1	U
86-73-7	Fluorene	1	U
132-65-0	Dibenzothiophene	1	U
85-01-8	Phenanthrene	3	B
120-12-7	Anthracene	1	U
260-94-6	Acridine	3	U
86-74-8	Carbazole	2	U
206-44-0	Fluoranthene	2	
129-00-0	Pyrene	1	BJ
56-55-3	Benzo(A)Anthracene	2	U
218-01-9	Chrysene	3	U
205-99-2	Benzo(B)Fluoranthene	2	U
207-08-9	Benzo(K)Fluoranthene	2	U
192-97-2	Benzo(E)Pyrene	2	U
50-32-8	Benzo(A)Pyrene	2	U
198-55-0	Perylene	2	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2	U
53-70-3	Dibenz(A,H)Anthracene	2	U
191-24-2	Benzo(G,H,I)Perylene	2	BJ



CASE NARRATIVE

FOR

City of St. Louis Park

September 09, 1992

Enseco - RMAL Project Number 023478

Introduction

Nine aqueous samples (includes QC) were received at Enseco Rocky Mountain Analytical Laboratory on June 23, 1992. The samples were logged in under RMAL project number 023478. Sample PCJ-SLP5FBD-062292 was extracted and held per the April 1990 QAPP. A cross reference associating the RMAL sample numbers to the actual field sample numbers is included. The samples were analyzed for medium level part-per-trillion (ppt) polynuclear aromatic hydrocarbons (PAH).

Data Quality Assessment

The results contained in this report were reviewed relative to data acceptance criteria as specified in the April, 1990 QAPP for completeness, precision, accuracy, representativeness and defensibility of the data. Unless otherwise stated below, no quality control problems or technical difficulties were encountered which would impact the interpretation or use of data in this report.

PPT PAH

23478-001MS matrix spike and -0001SD matrix spike duplicate % recovery for Quinoline was outside QC limits. Since good recovery was achieved for all other spike components (between the range of 50-100%), quantitation was checked and no further action was taken.

Sample 023478-04 show target compounds above the upper calibration range. This sample was reanalyzed at a dilution. Both the original and reanalysis data are reported for the sample.

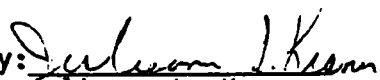
The 4800 ng/ml and the 2400 ng/ml standards had excessive saturation, therefore they were not used as the upper range for the 5-point calibration curve. Instead, the calibration curve used was, 20 ng/ml, 40 ng/ml, 240 ng/ml, 600 ng/ml, and 1200 ng/ml.

Case Narrative - RMAL #023478
September 08, 1992
Page Two

Samples 023478-01 thru 04, 01FB, 01DU, 01MS, 01SD, and the associated method blank for 06/25/92 extraction (BLK01), and the associated method blank for 06/27/92 extraction (BLK02) show target compounds that do not meet secondary ion confirmation. In some instances a compound that does not meet secondary ion confirmation criteria may still be determined to be present in the sample after close inspection of the data by the analyst. Supportive data includes mass chromatograms maxima at the same scan for primary and secondary ions, as well as discernible quantitation interference with the secondary ion. These compounds are flagged with the letter (R) on the data sheets (Form I) as per the 1990 QAPP.

This data package is in compliance with the terms and conditions of the 1990 QAPP, both technically and for completeness, for other than the conditions detailed above.

Reported by:


Julieann L. Kramer
Program Administrator

Date:

Sept 09 1992

Approved by:


Mark Dymerski
Technical Manager

Date:

9/11/92



Qualifier Codes and Their Usage

- U** = Indicates compound was analyzed for but not detected. The sample quantitation limit must be corrected for dilution and for percent moisture. For example, 10 U for phenol in water if the sample final volume is the protocol-specified final volume. If a 1 to 10 dilution of extract is necessary, the reported limit is 100 U. For a soil sample, the value must also be adjusted for percent moisture.
- J** = Indicates an estimated value. This flag is used either when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed, or when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the sample quantitation limit but greater than zero. For example, if the sample quantitation limit is 10 ug/L, but a concentration of 3 ug/L is calculated, report it as 3J. The sample quantitation limit must be adjusted for dilution as discussed for the U flag.
- N** = Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds, where the identification is based on a mass spectral library search. It is applied to all TIC results.
- P** = This flag is used for a pesticide/Aroclor target analyte when there is greater than 25% difference for detected concentrations between the two GC columns (see Form X). The lower of the two values is reported on Form I and flagged with a "P".
- C** = This flag applies to pesticide results where the identification has been confirmed by GC/MS. If GC/MS confirmation was attempted but was unsuccessful, do not apply this flag, instead use a laboratory-defined flag, discussed below.
- B** = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action. This flag must be used for a TIC as well as for a positively identified target compound.



Qualifier Codes and Their Usage

Page Two

- E = This flag identifies compounds whose concentrations exceed the calibration range of the GC/MS instrument for that specific analysis. If one or more compounds have a response greater than full scale, except as noted in Exhibit D, the sample or extract must be diluted and re-analyzed accordingly to the specifications in Exhibit D. All such compounds with a response greater than full scale should have the concentration flagged with an "E" on the Form I for the original analysis. If the dilution of the extract causes any compounds identified in the first analysis to be below the calibration range in the second analysis, then the results of both analyses shall be reported on separate copies of Form I. The Form I for the diluted sample shall have the "DL" suffix appended to the sample number. NOTE: For total xylenes, where three isomers are quantified as two peaks, the calibration range of each peak should be considered separately, e.g., a diluted analysis is not required for total xylenes unless the concentration of either peak separately exceeds 200 ug/L.
- D = This flag identifies all compounds identified in an analysis at a secondary dilution factor. If a sample or extract is re-analyzed at a higher dilution factor, as in the "E" flag above, the "DL" suffix is appended to the sample number on the Form I for the diluted sample, and all concentration values reported on that Form I are flagged with the "D" flag. This flag alerts data users that any discrepancies between the concentrations reported may be due to dilution of the sample or extract.
- A = This flag indicates that a TIC is a suspected aldol-condensation product.
- X = Other specific flags may be required to properly define the results. If used, they must be fully described, and such description attached to the Sample Data Summary Package and the SDG Narrative. Begin by using "X". If more than one flag is required, use "Y" and "Z" as needed. If more than five qualifiers are required for a sample result, use the "X" flag to combine several flags, as needed. For instance, the "X" flag might combine the "A", "B", and "D" flags for some sample. The laboratory-defined flags are limited to the letters "X", "Y", and "Z".
- R = This flag is used for polyaromatic hydrocarbons which show target compounds that do not meet secondary ion confirmation. In some instances a compound that does not meet secondary ion confirmation criteria may still be determined to be present in the sample after close inspection of the data by the analyst. Supportive data includes mass chromatograms maxima at the same scan for primary and secondary ions, as well as discernible quantitation interference with the secondary ion.

ANALYTICAL TEST REQUESTS
for
City of St. Louis Park

Lab ID: 023478	Group Code	Analysis Description	Custom Test?
0001 , 0001, 0002 - 0004	A	Polynuclear Aromatic Hydrocarbons, SIM Low Level	N
		Prep - PAH/SIM by GC/MS Low Level	N
0001	B	Prep - PAH/SIM by GC/MS Low Level	N



Rocky Mountain Analytical Laboratory
4955 Yarrow Street
Arvada, CO 80002
303/421-6611 FAX: 303/431-7171

CHAIN OF CUSTODY

ENSECO CLIENT <i>CITY OF ST LOUIS PARK (WATER DEPT)</i>		SAMPLE SAFE™ CONDITIONS	
PROJECT		PACKED BY <i>MZR</i>	SEAL NUMBER
SAMPLING COMPANY		SEAL INTACT UPON RECEIPT BY SAMPLING COMPANY	CONDITION OF CONTENTS
SAMPLING SITE <i>SMME</i>		SEALED FOR SHIPPING BY <i>MZR</i>	INITIAL CONTENTS TEMP. °C
TEAM LEADER <i>SMME</i>		SEAL NUMBER	SAMPLING STATUS <input type="checkbox"/> Done <input type="checkbox"/> Continuing Until
		SEAL INTACT UPON RECEIPT BY LAB. <input type="checkbox"/> Yes <input type="checkbox"/> No	CONTENTS TEMPERATURE UPON RECEIPT BY LAB. °C

DATE	TIME	SAMPLE ID/DESCRIPTION	SAMPLE TYPE	# CONTAINERS	ANALYSIS PARAMETERS	REMARKS
6-22-92		PCT-SLPS -062292 <i>Ø1</i>	IXL AMBER	6	PPT PAH	PPT 5
6-22-92		PCT-SLPSD -062292 <i>Ø2</i> <i>OIDU</i>	IXL AMBER	6	PPT PAH	PPT 5

CUSTODY TRANSFERS PRIOR TO SHIPPING				SHIPPING DETAILS			
RELINQUISHED BY (SIGNED)	RECEIVED BY (SIGNED)	DATE	TIME	DELIVERED TO SHIPPER BY <i>MZR</i>			
				METHOD OF SHIPMENT <i>FED EX</i>		AIRBILL NUMBER <i>210 3425410</i>	
				RECEIVED FOR LAB <i>ENSECO - RMAL</i>	SIGNED <i>Robert M. Reitz</i>	DATE/TIME <i>0830 hrs, 23 JUN 92</i>	
				ENSECO PROJECT NUMBER <i>23478</i>			



Rocky Mountain Analytical Laboratory
4955 Yarrow Street
Arvada, CO 80002
303/421-6611 FAX: 303/431-7171

CHAIN OF CUSTODY

ENSECO CLIENT		SAMPLE SAFE™ CONDITIONS	
PROJECT <i>CITY OF ST LOUIS PARK (WATER DEPT)</i>		PACKED BY <i>MZK</i>	SEAL NUMBER
SAMPLING COMPANY		SEAL INTACT UPON RECEIPT BY SAMPLING COMPANY	CONDITION OF CONTENTS
SAMPLING SITE <i>SNIE</i>		SEALED FOR SHIPPING BY <i>MZK</i>	INITIAL CONTENTS TEMP. °C
TEAM LEADER <i>MZK</i>		SEAL NUMBER	SAMPLING STATUS <input type="checkbox"/> Done <input type="checkbox"/> Continuing Until
		SEAL INTACT UPON RECEIPT BY LAB. <input type="checkbox"/> Yes <input type="checkbox"/> No	CONTENTS TEMPERATURE UPON RECEIPT BY LAB. °C

DATE	TIME	SAMPLE ID/DESCRIPTION	SAMPLE TYPE	# CONTAINERS	ANALYSIS PARAMETERS	REMARKS
6-22-92		PCU-SLP5FB-062292-01FB	03 XLADDER	6	PPT PAH	PPT 5
6-22-92		PCU-SLP5FBD-062292-01FBD	04 XLADDER	6	PPT PAH	PPT 5

CUSTODY TRANSFERS PRIOR TO SHIPPING				SHIPPING DETAILS	
RELINQUISHED BY (SIGNED)	RECEIVED BY (SIGNED)	DATE	TIME	DELIVERED TO SHIPPER BY <i>MZK</i>	
				METHOD OF SHIPMENT <i>FED EX</i>	AIRBILL NUMBER <i>2103420410</i>
				RECEIVED FOR LAB <i>ENSECO - RMAZ</i>	SIGNED <i>Robert M. Ritz</i>
				ENSECO PROJECT NUMBER <i>23478</i>	DATE/TIME <i>0830hrs, 23 JUN 92</i>



Rocky Mountain Analytical Laboratory
4955 Yarrow Street
Arvada, CO 80002
303/421-6611 FAX: 303/431-7171

CHAIN OF CUSTODY

ENSECO CLIENT <i>CITY OF ST LOUIS PARK (WATER DEPT)</i>		SAMPLE SAFE™ CONDITIONS	
PROJECT		PACKED BY <i>MZR</i>	SEAL NUMBER
SAMPLING COMPANY <i>SAIYE</i>		SEAL INTACT UPON RECEIPT BY SAMPLING COMPANY	CONDITION OF CONTENTS
SAMPLING SITE <i>SAIYE</i>		SEALED FOR SHIPPING BY <i>MZR</i>	INITIAL CONTENTS TEMP. °C
TEAM LEADER <i>MZR</i>		SEAL NUMBER	SAMPLING STATUS <input type="checkbox"/> Done <input type="checkbox"/> Continuing Until
		SEAL INTACT UPON RECEIPT BY LAB <input type="checkbox"/> Yes <input type="checkbox"/> No	CONTENTS TEMPERATURE UPON RECEIPT BY LAB. °C

DATE	TIME	SAMPLE ID/DESCRIPTION	SAMPLE TYPE	# CONTAINERS	ANALYSIS PARAMETERS	REMARKS
6-22-92		PCJ-SLP5175-062292 <i>DMIX</i>	IXLAMBER	6	PPT PAH	PPT 5
6-22-92		PCJ-SLP5M5D-062292 <i>0150</i>	IXLAMBER	6	PPT PAH	PPT 5
6-22-92		MSH-SLP12-062292 <i>-05 02</i>	IXLAMBER	6	PPT PAH	PPT 5

CUSTODY TRANSFERS PRIOR TO SHIPPING				SHIPPING DETAILS	
RELINQUISHED BY (SIGNED)	RECEIVED BY (SIGNED)	DATE	TIME	DELIVERED TO SHIPPER BY <i>MZR</i>	
				METHOD OF SHIPMENT <i>FED EX</i>	AIRBILL NUMBER <i>2103420410</i>
				RECEIVED FOR LAB <i>ENSECO-RMAL</i>	SIGNED <i>Robert M. Rife</i>
				ENSECO PROJECT NUMBER <i>23478</i>	DATE/TIME <i>0830hrs 23 JUN 92</i>

CHAIN OF CUSTODY

ENSECO CLIENT <i>City of St. Louis Park</i>	SAMPLE SAFE™ CONDITIONS	
PROJECT <i>ENSR Consulting & Engineering</i>	PACKED BY <i>David W. Jacobson</i>	SEAL NUMBER <i>ENSECO SEAL-N27</i>
SAMPLING COMPANY <i>ENSR Consulting & Engineering</i>	SEAL INTACT UPON RECEIPT BY SAMPLING COMPANY	CONDITION OF CONTENTS
SAMPLING SITE <i>W-20 and E-3</i>	SEALED FOR SHIPPING BY <i>David W. Jacobson</i>	INITIAL CONTENTS TEMP. °C
TEAM LEADER	SEAL NUMBER	SAMPLING STATUS <input type="checkbox"/> Done <input type="checkbox"/> Continuing Until
	SEAL INTACT UPON RECEIPT BY LAB <input type="checkbox"/> Yes <input type="checkbox"/> No	CONTENTS TEMPERATURE UPON RECEIPT BY LAB °C

DATE	TIME	SAMPLE ID/DESCRIPTION	SAMPLE TYPE	# CONTAINERS	ANALYSIS PARAMETERS	REMARKS
<i>6/22/92</i>	<i>11:38</i>	<i>PLJ-E3-062292-03</i>	<i>H₂O</i>	<i>6</i>	<i>ppt-PAH</i>	<i>ppt-5</i>
<i>6/22/92</i>	<i>13:05</i>	<i>PLJ-W20-062292-05</i>	<i>H₂O</i>	<i>6</i>	<i>ppt-PAH</i>	<i>ppt-5</i>

CUSTODY TRANSFERS PRIOR TO SHIPPING				SHIPPING DETAILS	
RELINQUISHED BY (SIGNED) <i>[Signature]</i> <i>to FedEx</i>	RECEIVED BY (SIGNED)	DATE <i>6/22/92</i>	TIME <i>1600</i>	DELIVERED TO SHIPPER BY <i>[Signature]</i>	AIRBILL NUMBER <i>2103420410</i>
				METHOD OF SHIPMENT <i>FED-EX</i>	
				RECEIVED FOR LAB <i>ENSECO-RMAL</i>	SIGNED <i>Robert M. Rish</i>
				ENSECO PROJECT NUMBER <i>23478</i>	DATE/TIME <i>0830hrs, 23 JUNE 92</i>

SAMPLE DESCRIPTION INFORMATION
for
City of St. Louis Park

Lab ID	Client ID	Matrix	Sampled Date	Time	Received Date
023478-0001-SA	PCJ-SLP5-062292	AQUEOUS	22 JUN 92		23 JUN 92
023478-0001-DU	PCJ-SLP5D-062292	AQUEOUS	22 JUN 92		23 JUN 92
023478-0001-FB	PCJ-SLP5FB-062292	AQUEOUS	22 JUN 92		23 JUN 92
023478-0001-FD	PCJ-SLP5FBD-062292	AQUEOUS	22 JUN 92		23 JUN 92
023478-0001-MS	PCJ-SLP5MS-062292	AQUEOUS	22 JUN 92		23 JUN 92
023478-0001-SD	PCJ-SLP5MSD-062292	AQUEOUS	22 JUN 92		23 JUN 92
023478-0002-SA	PCJ -SLP12-062292 <i>-MSH</i>	AQUEOUS	22 JUN 92		23 JUN 92
023478-0003-SA	PCJ-E3-062292	AQUEOUS	22 JUN 92	11:38	23 JUN 92
023478-0004-SA	PCJ-W70-062292	AQUEOUS	22 JUN 92	13:05	23 JUN 92

1X
ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

23478-02

Name: ENSECO

Contract:

MSH-SLP12-062292

Lab Code: ENSECO

Case No.: 23478

SAS No.:

SDG No.:

Matrix: (soil/water) WATER

Lab Sample ID: 23478-02

Sample wt/vol: 4200 (g/mL) ML

Lab File ID: C5944

Level: (low/med) LOW

Date Received: 06/23/92

% Moisture: decanted: (Y/N) N

Date Extracted: 06/25/92

Concentrated Extract Volume: 500(uL)

Date Analyzed: 08/03/92

Injection Volume: 2.0(uL)

Dilution Factor: 0.119

GPC Cleanup: (Y/N) N pH: 7.0

CONCENTRATION UNITS:
(ng/L or ug/Kg) ng/L

CAS NO.

COMPOUND

Q

271-89-6-----	2,3-Dibenzofuran	5	U
496-11-7-----	2,3-Dihydroindene	1	BJ
95-13-6-----	1H-Indene	0.7	BJ
91-20-3-----	Naphthalene	4	BJ
4565-32-6-----	Benzo(B)Thiophene	0.9	U
91-22-5-----	Quinoline	1	U
120-72-9-----	1H-Indole	0.4	J
91-57-6-----	2-Methylnaphthalene	3	B
90-12-0-----	1-Methylnaphthalene	2	B
92-52-4-----	Biphenyl	0.8	BJ
208-96-8-----	Acenaphthylene	1	U
83-32-9-----	Acenaphthene	0.6	BJ
132-64-9-----	Dibenzofuran	1	U
86-73-7-----	Fluorene	0.7	BJ
132-65-0-----	Dibenzothiophene	1	U
85-01-8-----	Phenanthrene	4	B
120-12-7-----	Anthracene	5	
260-94-6-----	Acridine	0.4	J
86-74-8-----	Carbazole	0.3	J
206-44-0-----	Fluoranthene	1	BJ
129-00-0-----	Pyrene	1	BJ
56-55-3-----	Benzo(A)Anthracene	2	U
218-01-9-----	Chrysene	3	U
205-99-2-----	Benzo(B)Fluoranthene	2	U
207-08-9-----	Benzo(K)Fluoranthene	2	U
192-97-2-----	Benzo(E)Pyrene	2	U
50-32-8-----	Benzo(A)Pyrene	2	U
198-55-0-----	Perylene	2	U
193-39-5-----	Indeno(1,2,3-CD)Pyrene	2	U
53-70-3-----	Dibenz(A,H)Anthracene	2	U
191-24-2-----	Benzo(G,H,I)Perylene	1	BJ



CASE NARRATIVE

FOR

City of St. Louis Park

December 17, 1992

Enseco - RMAL Project Number 026507

Introduction

Eleven aqueous samples (includes QC) were received at Enseco Rocky Mountain Analytical Laboratory on December 01, 1992. The samples were logged in under RMAL project number 026507. Sample GAC-SLP4FBD-113092 was extracted and held per the April 1990 QAPP. A cross reference associating the RMAL sample numbers to the actual field sample numbers is included. The samples were analyzed for low level part-per-trillion (ppt) polynuclear aromatic hydrocarbons (PAH).

Data Quality Assessment

The results contained in this report were reviewed relative to data acceptance criteria as specified in the April, 1990 QAPP for completeness, precision, accuracy, representativeness and defensibility of the data. Unless otherwise stated below, no quality control problems or technical difficulties were encountered which would impact the interpretation or use of data in this report.

PPT PAH

Sample 026507-0004, showed a surrogate which exceeded the upper control limits. All instrument calibration, surrogate standard concentration, etc. were checked and found to be in control. It has been concluded that an interference specific to the surrogate is present which resulted in the high recoveries. This interference does not affect the quantitation of target components.



Case Narrative - RMAL #026507
December 17, 1992
Page Two

26507-0001MS/SD matrix spike percent recovery for Quinoline was reported outside of QC limits due to an interference present in the sample. Quantitation was checked and no further action was taken.

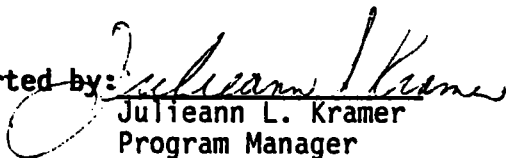
Sample 026507-0001DU showed target compounds above the upper calibration range. The sample was reanalyzed at dilutions. Both the original and reanalysis data are reported for this sample.

The 4800 ng/ml and the 2400 ng/ml standards had excessive saturation, therefore they were not used as the upper range for the 5-point calibration curve. Instead, the calibration curve used was, 20 ng/ml, 40 ng/ml, 240 ng/ml, 600 ng/ml, and 1200 ng/ml.

All samples associated with project 026507 show target compounds that do not meet secondary ion confirmation. In some instances a compound that does not meet secondary ion confirmation criteria may still be determined to be present in the sample after close inspection of the data by the analyst. Supportive data includes mass chromatograms maxima at the same scan for primary and secondary ions, as well as discernible quantitation interference with the secondary ion. These compounds are flagged with the letter (R) on the data sheets (Form I) as per the 1990 QAPP.

This data package is in compliance with the terms and conditions of the 1990 QAPP, both technically and for completeness, for other than the conditions detailed above.

Reported by:


Julieann L. Kramer
Program Manager

Date:

12/17/92

Approved by:


Mark Dymerski
Technical Manager

Date:

12/17/92



Qualifier Codes and Their Usage

- U = Indicates compound was analyzed for but not detected. The sample quantitation limit must be corrected for dilution and for percent moisture. For example, 10 U for phenol in water if the sample final volume is the protocol-specified final volume. If a 1 to 10 dilution of extract is necessary, the reported limit is 100 U. For a soil sample, the value must also be adjusted for percent moisture.
- J = Indicates an estimated value. This flag is used either when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed, or when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the sample quantitation limit but greater than zero. For example, if the sample quantitation limit is 10 ug/L, but a concentration of 3 ug/L is calculated, report it as 3J. The sample quantitation limit must be adjusted for dilution as discussed for the U flag.
- N = Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds, where the identification is based on a mass spectral library search. It is applied to all TIC results.
- P = This flag is used for a pesticide/Aroclor target analyte when there is greater than 25% difference for detected concentrations between the two GC columns (see Form X). The lower of the two values is reported on Form I and flagged with a "P".
- C = This flag applies to pesticide results where the identification has been confirmed by GC/MS. If GC/MS confirmation was attempted but was unsuccessful, do not apply this flag, instead use a laboratory-defined flag, discussed below.
- B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action. This flag must be used for a TIC as well as for a positively identified target compound.



Qualifier Codes and Their Usage

Page Two

- E** = This flag identifies compounds whose concentrations exceed the calibration range of the GC/MS instrument for that specific analysis. If one or more compounds have a response greater than full scale, except as noted in Exhibit D, the sample or extract must be diluted and re-analyzed accordingly to the specifications in Exhibit D. All such compounds with a response greater than full scale should have the concentration flagged with an "E" on the Form I for the original analysis. If the dilution of the extract causes any compounds identified in the first analysis to be below the calibration range in the second analysis, then the results of both analyses shall be reported on separate copies of Form I. The Form I for the diluted sample shall have the "DL" suffix appended to the sample number. NOTE: For total xylenes, where three isomers are quantified as two peaks, the calibration range of each peak should be considered separately, e.g., a diluted analysis is not required for total xylenes unless the concentration of either peak separately exceeds 200 ug/L.
- D** = This flag identifies all compounds identified in an analysis at a secondary dilution factor. If a sample or extract is re-analyzed at a higher dilution factor, as in the "E" flag above, the "DL" suffix is appended to the sample number on the Form I for the diluted sample, and all concentration values reported on that Form I are flagged with the "D" flag. This flag alerts data users that any discrepancies between the concentrations reported may be due to dilution of the sample or extract.
- A** = This flag indicates that a TIC is a suspected aldol-condensation product.
- X** = Other specific flags may be required to properly define the results. If used, they must be fully described, and such description attached to the Sample Data Summary Package and the SDG Narrative. Begin by using "X". If more than one flag is required, use "Y" and "Z" as needed. If more than five qualifiers are required for a sample result, use the "X" flag to combine several flags, as needed. For instance, the "X" flag might combine the "A", "B", and "D" flags for some sample. The laboratory-defined flags are limited to the letters "X", "Y", and "Z".
- R** = This flag is used for polyaromatic hydrocarbons which show target compounds that do not meet secondary ion confirmation. In some instances a compound that does not meet secondary ion confirmation criteria may still be determined to be present in the sample after close inspection of the data by the analyst. Supportive data includes mass chromatograms maxima at the same scan for primary and secondary ions, as well as discernible quantitation interference with the secondary ion.

SAMPLE DESCRIPTION INFORMATION
for
City of St. Louis Park

Lab ID	Client ID	Matrix	Sampled Date	Time	Received Date
026507-0001-SA	GAC-SLP4F-113092	AQUEOUS	30 NOV 92		01 DEC 92
026507-0001-DU	GAC-SLP4FD-113092	AQUEOUS	30 NOV 92		01 DEC 92
026507-0001-MS	GAC-SLP4MS-113092	AQUEOUS	30 NOV 92		01 DEC 92
026507-0001-SD	GAC-SLP4MSD-113092	AQUEOUS	30 NOV 92		01 DEC 92
026507-0001-FB	GAC-SLP4FB-113092	AQUEOUS	30 NOV 92		01 DEC 92
026507-0001-FD	GAC-SLP4FBD-113092	AQUEOUS	30 NOV 92		01 DEC 92
026507-0002-SA	GAC-SLP4T-113092	AQUEOUS	30 NOV 92		01 DEC 92
026507-0002-DU	GAC-SLP4TD-113092	AQUEOUS	30 NOV 92		01 DEC 92
026507-0003-SA	PCJ-SLP16-113092	AQUEOUS	30 NOV 92		01 DEC 92
026507-0004-SA	PCJ -SLP17-113092 <i>MSH</i>	AQUEOUS	30 NOV 92		01 DEC 92
026507-0005-SA	GAC-SLP15T-113092	AQUEOUS	30 NOV 92		01 DEC 92

ANALYTICAL TEST REQUESTS
 for
 City of St. Louis Park

Lab ID: 026507	Group Code	Analysis Description	Custom Test?
0001 , 0001, 0002 - 0005	A	Polynuclear Aromatic Hydrocarbons, SIM Low Level Prep - PAH/SIM by GC/MS Low Level	N N
0001	B	Prep - PAH/SIM by GC/MS Low Level	N

TABLE OF CONTENTS
FOR
CITY OF ST. LOUIS PARK
RMAL PROJECT# 026507

PPT-PAH

QC Summary.....	0001
Sample Data.....	0014
Standards Data.....	0467
Raw QC Data.....	0874



☐ Rocky Mountain Analytical Laboratory
4955 Yarrow Street
Arvada, CO 80002
303/421-6611 FAX: 303/431-7171

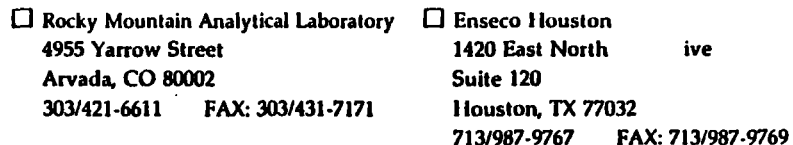
☐ Enseco Houston
1420 East North
Suite 120
Houston, TX 77032
713/987-9767 FAX: 713/987-9769

CHAIN OF CUSTODY

ENSECO CLIENT <i>CITY OF ST LOUIS PARK (WATER DEPT)</i>		SAMPLE SAFE™ CONDITIONS	
PROJECT		PACKED BY <i>MZR</i>	SEAL NUMBER
SAMPLING COMPANY <i>SAME</i>		SEAL INTACT UPON RECEIPT BY SAMPLING COMPANY	CONDITION OF CONTENTS
SAMPLING SITE <i>SAME</i>		SEALED FOR SHIPPING BY <i>MZR</i>	INITIAL CONTENTS TEMP. °C
TEAM LEADER <i>MZR</i>		SEAL NUMBER	SAMPLING STATUS <input type="checkbox"/> Done <input type="checkbox"/> Continuing Until
		SEAL INTACT UPON RECEIPT BY LAB. <input type="checkbox"/> Yes <input type="checkbox"/> No	CONTENTS TEMPERATURE UPON RECEIPT BY LAB. <i>(#3443)</i> <i>11.0</i> °C

DATE	TIME	SAMPLE ID/DESCRIPTION	SAMPLE TYPE	# CONTAINERS	ANALYSIS PARAMETERS	REMARKS
11-30-92		BAC-SLP4F-113092 -01 SA	IXL AMBER	6	PPT PAH	
11-30-92		BAC-SLP4FD-113092 -01 DU	IXL AMBER	6	PPT PAH	
11-30-92		BAC-SLP4MSD-113092 -01 SD	IXL AMBER	6	PPT PAH	

CUSTODY TRANSFERS PRIOR TO SHIPPING				SHIPPING DETAILS	
RELINQUISHED BY (SIGNED)	RECEIVED BY (SIGNED)	DATE	TIME	DELIVERED TO SHIPPER BY <i>MZR</i>	
				METHOD OF SHIPMENT <i>FED EX</i>	AIRBILL NUMBER <i>2103420572</i>
				RECEIVED FOR LAB <i>ENSECO - Rana</i>	SIGNED <i>Robert M. Ritz</i>
				ENSECO PROJECT NUMBER <i>26507</i>	DATE/TIME <i>0900hrs, 01 DEC 92</i>



ENSECO CLIENT
PROJECT CITY OF ST LOUIS PARK (WATER DEPT)

SAMPLING COMPANY

SAMPLING SITE *5A17C*

TEAM LEADER SAME
MZK

PACKED BY <i>7728</i>		SEAL NUMBER
SEAL INTACT UPON RECEIPT BY SAMPLING COMPANY		CONDITION OF CONTENTS
SEALED FOR SHIPPING BY <i>7728</i>		INITIAL CONTENTS TEMP. °C
SEAL NUMBER	SAMPLING STATUS <input type="checkbox"/> Done <input type="checkbox"/> Continuing Until	
SEAL INTACT UPON RECEIPT BY LAB. <input type="checkbox"/> Yes <input type="checkbox"/> No		CONTENTS TEMPERATURE UPON RECEIPT BY LAB. <i>(#3453)</i> 96 °C

SHIPPING DETAILS

RELINQUISHED BY (SIGNED)	RECEIVED BY (SIGNED)	DATE	TIME	DELIVERED TO SHIPPER BY M2X	
				METHOD OF SHIPMENT FED EX	AIRBILL NUMBER 2103420582
				RECEIVED FOR LAB ENSECO - Rmal	SIGNED Robert M. Ritz DATE/TIME 0900 hr 01 DEC 92
				ENSECO PROJECT NUMBER 26507	



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 303/421-6611 FAX: 303/431-7171

☐ Ensco Houston
 1420 East North
 Suite 120
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 713/987-9767 FAX: 713/987-9769

CHAIN OF CUSTODY

ENSECO CLIENT <i>CITY OF ST LOUIS PARK (WATER DEPT)</i>		SAMPLE SAFE™ CONDITIONS PACKED BY <i>MJR</i>	
PROJECT <i>SAITE</i>		SEAL INTACT UPON RECEIPT BY SAMPLING COMPANY SEaled FOR SHIPPING BY <i>MJR</i>	
SAMPLING COMPANY <i>SAITE</i>		SEAL NUMBER SAMPLING STATUS <input type="checkbox"/> Done <input type="checkbox"/> Continuing Until	
SAMPLING SITE <i>SAITE</i>		SEAL INTACT UPON RECEIPT BY LAB. <input type="checkbox"/> Yes <input type="checkbox"/> No	
TEAM LEADER <i>MJR</i>		CONTENTS TEMPERATURE UPON RECEIPT BY LAB. <i>(#3127) 10.2 °C</i>	

DATE	TIME	SAMPLE ID/DESCRIPTION	SAMPLE TYPE	# CONTAINERS	ANALYSIS PARAMETERS	REMARKS
11-30-92		BAC-SLP4T-113092 -02SA	IXL AMBER	6	PPT PAH	
11-30-92		BAC-SLP4TD-113092 -02SA	IXL AMBER	6	PPT PAH	
11-30-92		BAC-SLP4MS-113092 -01MS	IXL AMBER	6	PPT PAH	

CUSTODY TRANSFERS PRIOR TO SHIPPING				SHIPPING DETAILS			
RELINQUISHED BY (SIGNED)	RECEIVED BY (SIGNED)	DATE	TIME	DELIVERED TO SHIPPER BY <i>MJR</i>		METHOD OF SHIPMENT <i>FED EX</i>	
				RECEIVED FOR LAB <i>ENSECO-RMAL</i>		AIRBILL NUMBER <i>2103420582</i>	
				ENSECO PROJECT NUMBER <i>26507</i>		DATE/TIME <i>0900hrs, 01 DEC 92</i>	
				SIGNED <i>Robert M. Ritz</i>			



Rocky Mountain Analytical Laboratory
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CHAIN OF CUSTODY

ENSECO CLIENT CITY OF ST LOUIS PARK (WATER DEPT)		SAMPLE SAFE™ CONDITIONS	
PROJECT SAISE		PACKED BY MZR	SEAL NUMBER
SAMPLING COMPANY SAISE		SEAL INTACT UPON RECEIPT BY SAMPLING COMPANY	CONDITION OF CONTENTS
SAMPLING SITE SAISE		SEALED FOR SHIPPING BY MZR	INITIAL CONTENTS TEMP. °C
TEAM LEADER MZR		SEAL NUMBER	SAMPLING STATUS <input type="checkbox"/> Done <input type="checkbox"/> Continuing Until
SEAL INTACT UPON RECEIPT BY LAB. <input type="checkbox"/> Yes <input type="checkbox"/> No		CONTENTS TEMPERATURE UPON RECEIPT BY LAB. (#356) 8.5 °C	

DATE	TIME	SAMPLE ID/DESCRIPTION	SAMPLE TYPE	# CONTAINERS	ANALYSIS PARAMETERS	REMARKS
11-30-92		PCJ-SLP16-113092 -03	1XL AMBER	6	PPT PAH	
11-30-92		PCJ-SLP17-113092 -04	1XL AMBER	6	PPT PAH	
11-30-92		GAC-SLP15T-113092 -05	1XL AMBER	6	PPT PAH	

CUSTODY TRANSFERS PRIOR TO SHIPPING				SHIPPING DETAILS	
RELINQUISHED BY (SIGNED)	RECEIVED BY (SIGNED)	DATE	TIME	DELIVERED TO SHIPPER BY MZR	
				METHOD OF SHIPMENT FED EX	AIRBILL NUMBER 2103420522
				RECEIVED FOR LAB ENSECO - Rmar	SIGNED Robert M. Ritz
				ENSECO PROJECT NUMBER 26507	DATE/TIME OF DELIVERY 0900 hrs

1X
ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

26507-04

Name: ENSECO	Contract:		
Lab Code: ENSECO	Case No.: 26507	SAS No.:	PCJ-SLP17-113092 SDG No.:
Matrix: (soil/water) WATER		Lab Sample ID:	26507-04
Sample wt/vol: 4200 (g/mL) ML		Lab File ID:	C6992
Level: (low/med) LOW		Date Received:	12/01/92
% Moisture: decanted: (Y/N) N		Date Extracted:	12/03/92
Concentrated Extract Volume: 500(uL)		Date Analyzed:	12/11/92
Injection Volume: 2.0(uL)		Dilution Factor:	0.119
GPC Cleanup: (Y/N) N	pH: 7.0		

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ng/L or ug/Kg) ng/L	Q
---------	----------	--	---

271-89-6-----	2,3-Dibenzofuran	5	U
496-11-7-----	2,3-Dihydroindene	3	
95-13-6-----	1H-Indene	0.9	U
91-20-3-----	Naphthalene	14	BR
4565-32-6-----	Benzo(B)Thiophene	0.9	U
91-22-5-----	Quinoline	1	J
120-72-9-----	1H-Indole	6	
91-57-6-----	2-Methylnaphthalene	4	B
90-12-0-----	1-Methylnaphthalene	2	R
92-52-4-----	Biphenyl	1	J
208-96-8-----	Acenaphthylene	2	R
83-32-9-----	Acenaphthene	1	J
132-64-9-----	Dibenzofuran	1	R
86-73-7-----	Fluorene	1	
132-65-0-----	Dibenzothiophene	1	U
85-01-8-----	Phenanthrene	6	B
120-12-7-----	Anthracene	1	U
260-94-6-----	Acridine	1	JR
86-74-8-----	Carbazole	1	JR
206-44-0-----	Fluoranthene	2	B
129-00-0-----	Pyrene	2	B
56-55-3-----	Benzo(A)Anthracene	2	U
218-01-9-----	Chrysene	3	U
205-99-2-----	Benzo(B)Fluoranthene	2	JR
207-08-9-----	Benzo(K)Fluoranthene	2	U
192-97-2-----	Benzo(E)Pyrene	2	U
50-32-8-----	Benzo(A)Pyrene	2	U
198-55-0-----	Perylene	2	U
193-39-5-----	Indeno(1,2,3-CD)Pyrene	2	U
53-70-3-----	Dibenz(A,H)Anthracene	2	U
191-24-2-----	Benzo(G,H,I)Perylene	3	U

APPENDIX B

**LABORATORY DATA SUMMARY PACKAGE:
IRONTON-GALESVILLE AQUIFER**

CITY OF ST. LOUIS PARK

Ironton Galesville Aquifer 1992 PAH Quality Control Summary

Well No	Sample Date	Method Blank	Field Duplicate	Matrix Spike	Matrix Spike Dup.	Field Blank
---------	-------------	--------------	-----------------	--------------	-------------------	-------------

RAP Section 6.1.4

W105	02/11/92	20863-BLK-02	IGV-W105D-021192	IGV-W105MS-021192	IGV-W105MSD-021192	IGV-W105FB-021192
W105	06/03/92	23144-BLK-04	PCJ-SLP10D-060292	PCJ-SLP10MS-060292	PCJ-SLP10MSD-060292	PCJ-SLP10FB-060292
W105	11/10/92	26220-BLK-01	PCJ-SLP15D-111092	STP-W410MS-110992	STP-W410MSD-110992	PCJ-SLP15FB-111092
W105	01/11/93	27112-BLK-01	IGV-W105-011193	IGV-W105MS-011193	IGV-W105MSD-011193	IGV-W105FB-011193
W105	01/19/93	27245-BLK-01	IGV-W105-011993	IGV-W105MS-011993	IGV-W105MSD-011993	IGV-W105FB-011993

Phenolic Quality Control Summary

W105	12/01/92	26522-BLK	DPV-W422TPD-120192	DPV-W422TPMS-120192		DPV-W422TPFB-120192
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RAP SECTION 6.1.4. MONITORING

1ST QUARTER - 1992



CASE NARRATIVE

FOR

City of St. Louis Park

April 12, 1992

Enseco - RMAL Project Number 020863

Introduction

Ten aqueous samples (includes QC) were received at Enseco Rocky Mountain Analytical Laboratory on February 12, 1992. The samples were logged in under RMAL project number 020863. Sample IGV-W105FBD-021192 (RMAL 020863-0007) was extracted and held as per the April 1990 QAPP. A cross reference associating the RMAL sample numbers to the actual field sample numbers is included. Samples 020863-0001, -0002, -0003, -0004, and -0006 were analyzed for low level part-per-trillion (ppt) polynuclear aromatic hydrocarbons (PAH). Samples 020863-0005, -0005MS, -0005SD, and -0005DU were analyzed for medium level part-per-trillion (ppt) polynuclear aromatic hydrocarbons (PAH).

Data Quality Assessment

The results contained in this report were reviewed relative to data acceptance criteria as specified in the April 1990 QAPP for completeness, precision, accuracy, representativeness and defensibility of the data. Unless otherwise stated below, no quality control problems or technical difficulties were encountered which would impact the interpretation or use of data in this report.

PPT PAH

Samples 020863-01, 02, 03, and 04, show target compounds above the upper calibration range. The samples were reanalyzed at dilutions. Both the original and reanalysis data are reported for each sample. Surrogates could not be measured in samples 20863-01DL, -02DL, -03DL, and 04DL due to the level of dilutions performed.

Samples 020863-02, 06, 05, 05DU, 05MS, 05SD, and both associated blanks show surrogates which have exceeded the upper control limits. All instrument calibration, surrogate standard concentration, etc. were checked and found to be in control.



Case Narrative - RMAL #020863
April 12, 1992
Page Two

The 4800 ng/ml and the 2400 ng/ml standards had excessive saturation, therefore they were not used as the upper range for the 5-point calibration curve. Instead, the calibration curve used was, 20 ng/ml, 40 ng/ml, 240 ng/ml, 600 ng/ml, and 1200 ng/ml.

All samples and the associated method blanks show target compounds that do not meet secondary ion confirmation. In some instances a compound that does not meet secondary ion confirmation criteria may still be determined to be present in the sample after close inspection of the data by the analyst. Supportive data includes mass chromatograms maxima at the same scan for primary and secondary ions, as well as discernible quantitation interference with the secondary ion. These compounds are flagged with asterisk (*) on the data sheets (Form I) as per the 1990 QAPP.

This data package is in compliance with the terms and conditions of the 1990 QAPP, both technically and for completeness, for other than the conditions detailed above.

Reported by: Julieann L. Kramer
Julieann L. Kramer
Program Administrator

Date: April 12, 1992

Approved by: Mark Dymerski
Mark Dymerski
Technical Manager

Date: 4/13/92



Qualifier Codes and Their Usage

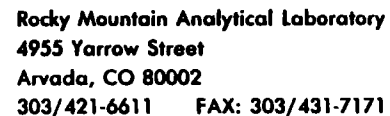
- U** = Indicates compound was analyzed for but not detected. The sample quantitation limit must be corrected for dilution and for percent moisture. For example, 10 U for phenol in water if the sample final volume is the protocol-specified final volume. If a 1 to 10 dilution of extract is necessary, the reported limit is 100 U. For a soil sample, the value must also be adjusted for percent moisture.
- J** = Indicates an estimated value. This flag is used either when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed, or when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the sample quantitation limit but greater than zero. For example, if the sample quantitation limit is 10 ug/L, but a concentration of 3 ug/L is calculated, report it as 3J. The sample quantitation limit must be adjusted for dilution as discussed for the U flag.
- N** = Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds, where the identification is based on a mass spectral library search. It is applied to all TIC results.
- P** = This flag is used for a pesticide/Aroclor target analyte when there is greater than 25% difference for detected concentrations between the two GC columns (see Form X). The lower of the two values is reported on Form I and flagged with a "P".
- C** = This flag applies to pesticide results where the identification has been confirmed by GC/MS. If GC/MS confirmation was attempted but was unsuccessful, do not apply this flag, instead use a laboratory-defined flag, discussed below.
- B** = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action. This flag must be used for a TIC as well as for a positively identified target compound.



Qualifer Codes and Their Usage

Page Two

- E = This flag identifies compounds whose concentrations exceed the calibration range of the GC/MS instrument for that specific analysis. If one or more compounds have a response greater than full scale, except as noted in Exhibit D, the sample or extract must be diluted and re-analyzed accordingly to the specifications in Exhibit D. All such compounds with a response greater than full scale should have the concentration flagged with an "E" on the Form I for the original analysis. If the dilution of the extract causes any compounds identified in the first analysis to be below the calibration range in the second analysis, then the results of both analyses shall be reported on separate copies of Form I. The Form I for the diluted sample shall have the "DL" suffix appended to the sample number. NOTE: For total xylenes, where three isomers are quantified as two peaks, the calibration range of each peak should be considered separately, e.g., a diluted analysis is not required for total xylenes unless the concentration of either peak separately exceeds 200 ug/L.
- D = This flag identifies all compounds identified in an analysis at a secondary dilution factor. If a sample or extract is re-analyzed at a higher dilution factor, as in the "E" flag above, the "DL" suffix is appended to the sample number on the Form I for the diluted sample, and all concentration values reported on that Form I are flagged with the "D" flag. This flag alerts data users that any discrepancies between the concentrations reported may be due to dilution of the sample or extract.
- A = This flag indicates that a TIC is a suspected aldol-condensation product.
- X = Other specific flags may be required to properly define the results. If used, they must be fully described, and such description attached to the Sample Data Summary Package and the SDG Narrative. Begin by using "X". If more than one flag is required, use "Y" and "Z" as needed. If more than five qualifiers are required for a sample result, use the "X" flag to combine several flags, as needed. For instance, the "X" flag might combine the "A", "B", and "D" flags for some sample. The laboratory-defined flags are limited to the letters "X", "Y", and "Z".



ENSECO CLIENT *City of St. Louis Park*

PROJECT

SAMPLING COMPANY
L. A. S. R. C. Y. E.

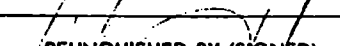
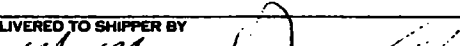


SAMPLING SITE
ST Louis Park

TEAM LEADER
137 [Signature]

PACKED BY		SEAL NUMBER	
SEAL INTACT UPON RECEIPT BY SAMPLING COMPANY		CONDITION OF CONTENTS	
SEALED FOR SHIPPING BY <i>M. MacIsaac</i>		INITIAL CONTENTS TEMP. <i>6°C</i> °C	
SEAL NUMBER <i>42856</i>	AMPLIFIED <i>seal</i>	SAMPLING STATUS <input type="checkbox"/> Done <input checked="" type="checkbox"/> Continuing Until <i>2/15</i>	
SEAL INTACT UPON RECEIPT BY LAB. <input type="checkbox"/> Yes <input type="checkbox"/> No		CONTENTS TEMPERATURE UPON RECEIPT BY LAB. °C	

[illegible]

SHIPPING DETAILS

RELINQUISHED BY (SIGNED)	RECEIVED BY (SIGNED)	DATE	TIME	DELIVERED TO SHIPPER BY	
					
				METHOD OF SHIPMENT	AIRBILL NUMBER
				EXP. EX.	
				RECEIVED FOR LAB	SIGNED
					
				ENSECO PROJECT NUMBER	DATE/TIME
				20864	02-18-92 0900



Rocky Mountain Analytical Laboratory
4955 Yarrow Street
Arvada, CO 80002
303/421-6611 FAX: 303/431-7171

CHAIN OF CUSTODY

ENSECO CLIENT <i>City of St Louis Park</i>		SAMPLE SAFE™ CONDITIONS	
PROJECT <i>(blank)</i>		PACKED BY <i>(blank)</i>	SEAL NUMBER <i>(blank)</i>
SAMPLING COMPANY <i>ENSR C9E</i>		SEAL INTACT UPON RECEIPT BY SAMPLING COMPANY <i>(blank)</i>	CONDITION OF CONTENTS <i>(blank)</i>
SAMPLING SITE <i>St St. Louis Park</i>		SEALED FOR SHIPPING BY <i>MM</i>	INITIAL CONTENTS TEMP. <i>11°C</i> °C
TEAM LEADER <i>MM MacDaniel</i>		SEAL NUMBER <i>42895</i> Analytical seal	SAMPLING STATUS <input type="checkbox"/> Done <input checked="" type="checkbox"/> Continuing Until <i>2/13</i>
		SEAL INTACT UPON RECEIPT BY LAB. <input type="checkbox"/> Yes <input type="checkbox"/> No	CONTENTS TEMPERATURE UPON RECEIPT BY LAB. <i>(blank)</i> °C

DATE	TIME	SAMPLE ID/DESCRIPTION	SAMPLE TYPE	# CONTAINERS	ANALYSIS PARAMETERS	REMARKS
2/1/92	1555	DPV W424 021192 -03	Water	6	PP7 PAH	-03
	1420	DPV W425 021192 -04		11	"	-04
	1505	DPV W438 021192 -08		2	PAB PAH	
	925	DPV W431 021192 -09		1	PPB Phenols	
	1420	DPV W425 TP 021192 -04				
	1130	DPV W437 TP 021192 -04				
	1330	DPV W435 TP -08				
	1335	DPV W426 TP -08				
	1053	DPV W43 P313 TP -04				
	1505	DPV W438 TP -05				

CUSTODY TRANSFERS PRIOR TO SHIPPING				SHIPPING DETAILS			
RELINQUISHED BY (SIGNED) <i>MM MacDaniel</i>	RECEIVED BY (SIGNED) <i>(blank)</i>	DATE <i>(blank)</i>	TIME <i>(blank)</i>	DELIVERED TO SHIPPER BY <i>MM MacDaniel</i>	METHOD OF SHIPMENT <i>Fed Ex</i>		AIRBILL NUMBER <i>(blank)</i>
				RECEIVED FOR LAB <i>RNAL</i>	SIGNED <i>Alu</i>	DATE/TIME <i>02-12-92 0900</i>	
				ENSECO PROJECT NUMBER <i>20864</i>			



Rocky Mountain Analytical Laboratory
4955 Yarrow Street
Arvada, CO 80002
303/421-6611 FAX: 303/431-7171

CHAIN OF CUSTODY

ENSECO CLIENT		SAMPLE SAFE™ CONDITIONS	
PROJECT CITY OF ST LOUIS PARK WATER DEPT		PACKED BY M J R	SEAL NUMBER
SAMPLING COMPANY		SEAL INTACT UPON RECEIPT BY SAMPLING COMPANY	CONDITION OF CONTENTS
SAMPLING SITE SAME		SEALED FOR SHIPPING BY M J R	INITIAL CONTENTS TEMP. °C
TEAM LEADER M J R		SEAL NUMBER	SAMPLING STATUS <input type="checkbox"/> Done <input type="checkbox"/> Continuing Until
		SEAL INTACT UPON RECEIPT BY LAB. <input type="checkbox"/> Yes <input type="checkbox"/> No	CONTENTS TEMPERATURE UPON RECEIPT BY LAB. °C

DATE	TIME	SAMPLE ID/DESCRIPTION	SAMPLE TYPE	# CONTAINERS	ANALYSIS PARAMETERS	REMARKS
2-11-92		DPV-W422TP-021192	16oz clear	1	PPB Phenolics	
		DPV-W422TPD-021192		1		
		DPV-W422TPFB-021192		1		
		DPV-W422TPFBD-021192		1		
		DPV-W422TPMS-021192		1		
2-11-92		DPV-W422TPMSD-021192	16oz clear	1	PPB Phenolics	

CUSTODY TRANSFERS PRIOR TO SHIPPING				SHIPPING DETAILS	
RELINQUISHED BY (SIGNED)	RECEIVED BY (SIGNED)	DATE	TIME	DELIVERED TO SHIPPER BY M J R	
				METHOD OF SHIPMENT FED EXP	AIRBILL NUMBER 2864993555
				RECEIVED FOR LAB RMAL	SIGNED [Signature]
				ENSECO PROJECT NUMBER 20863	DATE/TIME 2-12-92 0900



Rocky Mountain Analytical Laboratory
4955 Yarrow Street
Arvada, CO 80002
303/421-6611 FAX: 303/431-7171

CHAIN OF CUSTODY

ENSECO CLIENT <i>CITY OF ST LOUIS PARK WATER DEPT</i>		SAMPLE SAFE™ CONDITIONS	
PROJECT		PACKED BY <i>MZK</i>	SEAL NUMBER
SAMPLING COMPANY <i>SAME</i>		SEAL INTACT UPON RECEIPT BY SAMPLING COMPANY	CONDITION OF CONTENTS
SAMPLING SITE <i>SAME</i>		SEALED FOR SHIPPING BY <i>MZK</i>	INITIAL CONTENTS TEMP. °C
TEAM LEADER <i>MZK</i>		SEAL NUMBER	SAMPLING STATUS <input type="checkbox"/> Done <input type="checkbox"/> Continuing Until
		SEAL INTACT UPON RECEIPT BY LAB. <input type="checkbox"/> Yes <input type="checkbox"/> No	CONTENTS TEMPERATURE UPON RECEIPT BY LAB. °C

DATE	TIME	SAMPLE ID/DESCRIPTION	SAMPLE TYPE	# CONTAINERS	ANALYSIS PARAMETERS	REMARKS
2-11-92		DPV-W422-021192 01	IXL AMBER	2	PPB PAH	
		DPV-W422D-021192 02-02				
		DPV-W422FB-021192 03-03				
		DPV-W422FAD-021192 04-04				
		DPV-W422PIS-021192 01ms 05				
2-11-92		DPV-W422MSD-021192 01ms 06	IXL AMBER	2	PPB PAH	

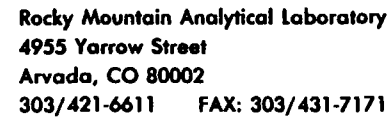
CUSTODY TRANSFERS PRIOR TO SHIPPING				SHIPPING DETAILS		
RELINQUISHED BY (SIGNED)	RECEIVED BY (SIGNED)	DATE	TIME	DELIVERED TO SHIPPER BY <i>MZK</i>		
				METHOD OF SHIPMENT <i>FED EXP</i>	AIRBILL NUMBER <i>2864993585</i>	
				RECEIVED FOR LAB <i>RNAL</i>	SIGNED <i>[Signature]</i>	DATE/TIME <i>02-12-92 0900</i>
				ENSECO PROJECT NUMBER <i>20863</i>		

CHAIN OF CUSTODY

ENSECO CLIENT <i>CITY OF ST LOUIS PARK WATER DEPT</i>		SAMPLE SAFE™ CONDITIONS	
PROJECT		PACKED BY <i>MZB</i>	SEAL NUMBER
SAMPLING COMPANY <i>SAVE</i>		SEAL INTACT UPON RECEIPT BY SAMPLING COMPANY	CONDITION OF CONTENTS
SAMPLING SITE <i>SAVE</i>		SEALED FOR SHIPPING BY <i>MZB</i>	INITIAL CONTENTS TEMP. °C
TEAM LEADER <i>MZB</i>		SEAL NUMBER	SAMPLING STATUS <input type="checkbox"/> Done <input type="checkbox"/> Continuing Until
		SEAL INTACT UPON RECEIPT BY LAB. <input type="checkbox"/> Yes <input type="checkbox"/> No	CONTENTS TEMPERATURE UPON RECEIPT BY LAB. °C

DATE	TIME	SAMPLE ID/DESCRIPTION	SAMPLE TYPE	# CONTAINERS	ANALYSIS PARAMETERS	REMARKS
2-11-92		IGV-W105-021192 <i>13</i>	IXL AMBER	6	PPT PAH	MEDIUM LEVEL PPT
2-11-92		IGV-W105D-021192 <i>14</i>	IXL AMBER	6	PPT PAH	OSDUP MEDIUM LEVEL PPT
2-11-92		IGV-W105FB-021192 <i>15</i>	IXL AMBER	6	PPT PAH	LOW LEVEL PPT

CUSTODY TRANSFERS PRIOR TO SHIPPING				SHIPPING DETAILS	
RELINQUISHED BY (SIGNED)	RECEIVED BY (SIGNED)	DATE	TIME	DELIVERED TO SHIPPER BY <i>MZB</i>	
				METHOD OF SHIPMENT <i>FED EXP</i>	AIRBILL NUMBER <i>2864993585</i>
				RECEIVED FOR LAB <i>RMA</i>	SIGNED <i>[Signature]</i>
				ENSECO PROJECT NUMBER <i>20863</i>	DATE/TIME <i>02-12-92 0800</i>



CHAIN OF CUSTODY		SAMPLE SAFE™ CONDITIONS	
ENSECO CLIENT		PACKED BY	SEAL NUMBER
PROJECT	CITY OF ST LOUIS PARK WATER DEPT	SEAL INTACT UPON RECEIPT BY SAMPLING COMPANY	CONDITION OF CONTENTS
SAMPLING COMPANY		SEALED FOR SHIPPING BY	INITIAL CONTENTS TEMP. °C
SAMPLING SITE	SAME	SEAL NUMBER	SAMPLING STATUS <input type="checkbox"/> Done <input type="checkbox"/> Continuing Until
TEAM LEADER	SAME	SEAL INTACT UPON RECEIPT BY LAB. <input type="checkbox"/> Yes <input type="checkbox"/> No	CONTENTS TEMPERATURE UPON RECEIPT BY LAB. °C

CUSTODY TRANSFERS PRIOR TO SHIPPING				SHIPPING DETAILS	
RELINQUISHED BY (SIGNED)	RECEIVED BY (SIGNED)	DATE	TIME	DELIVERED TO SHIPPER BY <i>M. J. B.</i>	
				METHOD OF SHIPMENT <i>FED EXP</i>	AIRBILL NUMBER <i>2864993585</i>
				RECEIVED FOR LAB <i>AMSL</i>	SIGNED <i>[Signature]</i> DATE/TIME <i>02-12-92 0900</i>
				ENSECO PROJECT NUMBER <i>20863</i>	

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CITY OF ST. LOUIS PARK
RMAL PROJECT# 020863

PPT-PAH

QC Summary.....	.0001
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Standards Data.....	.0571
Raw QC Data.....	.0984

SAMPLE DESCRIPTION INFORMATION
for
City of St. Louis Park

Lab ID	Client ID	Matrix	Sampled Date	Time	Received Date
020863-0001-SA	DPVW431021192	AQUEOUS	11 FEB 92	09:25	12 FEB 92
020863-0002-SA	DPVP313021192	AQUEOUS	11 FEB 92	10:53	12 FEB 92
020863-0003-SA	DPVW424021192	AQUEOUS	11 FEB 92	15:55	12 FEB 92
020863-0004-SA	DPVW425021192	AQUEOUS	11 FEB 92	14:20	12 FEB 92
020863-0005-SA	IGV-W105-021192	AQUEOUS	11 FEB 92		12 FEB 92
020863-0005-MS	IGV-W105MS-021192	AQUEOUS	11 FEB 92		12 FEB 92
020863-0005-SD	IGV-W105MSD-021192	AQUEOUS	11 FEB 92		12 FEB 92
020863-0005-DU	IGV-W105D-021192	AQUEOUS	11 FEB 92		12 FEB 92
020863-0006-FB	IGV-W105FB-021192	AQUEOUS	11 FEB 92		12 FEB 92
020863-0007-SA	IGV-W105FBD-021192	AQUEOUS	11 FEB 92		12 FEB 92

SUMMARY

DATA

PACKAGE

FOR

CITY OF ST. LOUIS PARK

RMAL#20863

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

20863-05

Lab Name: ENSECO

Contract No.:

IGV-W105-021192

Lab Code: ENSECO Case No.: 20863 SAS No.:

SDG No.:

Matrix: (soil/water) WATER

Lab Sample ID: 20863-05

Sample wt/vol: 500 (g/ml) ML

Lab File ID: C5381

Level: (low/med) MED

Date Received: 02/12/92

% Moisture: not dec. dec.

Date Extracted: 02/17/92

Extraction: (SepF/Cont/Sonc) CONT

Date Analyzed: 03/22/92

GPC Cleanup: (Y/N) N pH: 7.0

Dilution Factor: 10.0

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND	CONCENTRATION UNITS: NG/L	Q
271-89-6	2,3-Benzofuran	410	U
496-11-7	2,3-Dihydroindene	440	
95-13-6	1H-Indene	170	
91-20-3	Naphthalene	230	J
4565-32-6	Benzo(B)Thiophene	120	
91-22-5	Quinoline	110	U
120-72-9	1H-Indole	93	J
91-57-6	2-Methylnaphthalene	72	U
90-12-0	1-Methylnaphthalene	250	
92-52-4	Biphenyl	340	U
208-96-8	Acenaphthylene	110	U
83-32-9	Acenaphthene	200	
132-64-9	Dibenzofuran	82	
86-73-7	Fluorene	110	
132-65-0	Dibenzothiophene	88	U
85-01-8	Phenanthrene	210	
120-12-7	Anthracene	88	U
260-94-6	Acridine	230	U
86-74-8	Carbazole	150	U
206-44-0	Fluoranthene	150	
129-00-0	Pyrene	130	
56-55-3	Benzo(A)Anthracene	200	U
218-01-9	Chrysene	220	U
205-99-2	Benzo(B)Fluoranthene	200	U
207-08-9	Benzo(K)Fluoranthene	180	U
192-97-2	Benzo(E)Pyrene	150	U
50-32-8	Benzo(A)Pyrene	180	U
198-55-0	Perylene	200	U
193-39-5	Indeno(1,2,3-CD)Pyrene	170	U
53-70-3	Dibenz(A,H)Anthracene	130	U
191-24-2	Benzo(G,H,I)Perylene	220	U

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

20863-05DU

Lab Name: ENSECO

Contract No.:

W105

Lab Code: ENSECO Case No.: 20863 SAS No.:

SDG No.:

Matrix: (soil/water) WATER

Lab Sample ID: 20863-05DU

Sample wt/vol: 500 (g/ml) ML

Lab File ID: C5382

Level: (low/med) MED

Date Received: 02/12/92

% Moisture: not dec. dec.

Date Extracted: 02/17/92

Extraction: (SepF/Cont/Sonc) CONT

Date Analyzed: 03/23/92

GPC Cleanup: (Y/N) N pH: 7.0

Dilution Factor: 10.0

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND	CONCENTRATION UNITS: NG/L	Q
271-89-6-----	2,3-Benzofuran	410	U
496-11-7-----	2,3-Dihydroindene	400	
95-13-6-----	1H-Indene	160	
91-20-3-----	Naphthalene	210	J
4565-32-6-----	Benzo(B)Thiophene	110	
91-22-5-----	Quinoline	110	U
120-72-9-----	1H-Indole	99	J
91-57-6-----	2-Methylnaphthalene	72	U
90-12-0-----	1-Methylnaphthalene	230	
92-52-4-----	Biphenyl	340	U
208-96-8-----	Acenaphthylene	110	U
83-32-9-----	Acenaphthene	180	
132-64-9-----	Dibenzofuran	80	U
86-73-7-----	Fluorene	100	
132-65-0-----	Dibenzothiophene	88	U
85-01-8-----	Phenanthrene	210	
120-12-7-----	Anthracene	88	U
260-94-6-----	Acridine	230	U
86-74-8-----	Carbazole	150	U
206-44-0-----	Fluoranthene	150	
129-00-0-----	Pyrene	120	
56-55-3-----	Benzo(A)Anthracene	200	U
218-01-9-----	Chrysene	220	U
205-99-2-----	Benzo(B)Fluoranthene	200	U
207-08-9-----	Benzo(K)Fluoranthene	180	U
192-97-2-----	Benzo(E)Pyrene	150	U
50-32-8-----	Benzo(A)Pyrene	180	U
198-55-0-----	Perylene	200	U
193-39-5-----	Indeno(1,2,3-CD)Pyrene	170	U
53-70-3-----	Dibenz(A,H)Anthracene	130	U
191-24-2-----	Benzo(G,H,I)Perylene	220	U

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

20863-06

IGU-105FB-02/192

Lab Name: ENSECO

Contract No.:

Lab Code: ENSECO Case No.: 20863 SAS No.:

SDG No.:

Matrix: (soil/water) WATER

Lab Sample ID: 20863-06

Sample wt/vol: 4200 (g/ml) ML

Lab File ID: C5358

Level: (low/med) LOW

Date Received: 02/12/92

% Moisture: not dec. dec.

Date Extracted: 02/15/92

Extraction: (SepF/Cont/Sonc) CONT

Date Analyzed: 03/20/92

GPC Cleanup: (Y/N) N pH: 7.0

Dilution Factor: 0.119

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND	Q
271-89-6-----	2,3-Benzofuran-----	4.9 U
496-11-7-----	2,3-Dihydroindene-----	3.0
95-13-6-----	1H-Indene-----	1.7
91-20-3-----	Naphthalene-----	14 B
4565-32-6-----	Benzo(B)Thiophene-----	0.9 U
91-22-5-----	Quinoline-----	3.4
120-72-9-----	1H-Indole-----	2.4 U
91-57-6-----	2-Methylnaphthalene-----	6.9 B
90-12-0-----	1-Methylnaphthalene-----	3.4 B
92-52-4-----	Biphenyl-----	1.5 J *
208-96-8-----	Acenaphthylene-----	1.5 *
83-32-9-----	Acenaphthene-----	1.2 U
132-64-9-----	Dibenzofuran-----	1.0 B *
86-73-7-----	Fluorene-----	1.1 *
132-65-0-----	Dibenzothiophene-----	1.1 *
85-01-8-----	Phenanthrene-----	4.6 B
120-12-7-----	Anthracene-----	1.0 U
260-94-6-----	Acridine-----	2.8 U
86-74-8-----	Carbazole-----	1.8 U
206-44-0-----	Fluoranthene-----	2.7
129-00-0-----	Pyrene-----	2.3
56-55-3-----	Benzo(A)Anthracene-----	2.4 U
218-01-9-----	Chrysene-----	1.3 J *
205-99-2-----	Benzo(B)Fluoranthene-----	2.4 U
207-08-9-----	Benzo(K)Fluoranthene-----	2.2 U
192-97-2-----	Benzo(E)Pyrene-----	1.8 U
50-32-8-----	Benzo(A)Pyrene-----	2.2 U
198-55-0-----	Perylene-----	2.4 U
193-39-5-----	Indeno(1,2,3-CD)Pyrene-----	2.0 U
53-70-3-----	Dibenz(A,H)Anthracene-----	1.5 U
191-24-2-----	Benzo(G,H,I)Perylene-----	1.3 J

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

20863-05MS

Lab Name: ENSECO

Contract No.:

Lab Code: ENSECO

Case No.: 20863

SAS No.:

SDG No.:

Matrix: (soil/water) WATER

Lab Sample ID: 20863-05MS

Sample wt/vol: 500 (g/ml) ML

Lab File ID: C5374

Level: (low/med) MED

Date Received: 02/12/92

% Moisture: not dec. dec.

Date Extracted: 02/17/92

Extraction: (SepF/Cont/Sonc) CONT

Date Analyzed: 03/21/92

GPC Cleanup: (Y/N) N pH: 7.0

Dilution Factor: 10.0

		CONCENTRATION UNITS: NG/L		Q
CAS NO.	COMPOUND			
271-89-6	2,3-Benzofuran	410		U
496-11-7	2,3-Dihydroindene	420		
95-13-6	1H-Indene	3800		SC
91-20-3	Naphthalene	3400		SC
4565-32-6	Benzo(B)Thiophene	100		
91-22-5	Quinoline	3900		SC
120-72-9	1H-Indole	170	J	
91-57-6	2-Methylnaphthalene	4400		SC
90-12-0	1-Methylnaphthalene	270		
92-52-4	Biphenyl	340	U	
208-96-8	Acenaphthylene	110	U	
83-32-9	Acenaphthene	180		
132-64-9	Dibenzofuran	88		
86-73-7	Fluorene	4600		SC
132-65-0	Dibenzothiophene	88	U	
85-01-8	Phenanthrene	230		
120-12-7	Anthracene	88	U	
260-94-6	Acridine	230	U	
86-74-8	Carbazole	81	J	
206-44-0	Fluoranthene	170		
129-00-0	Pyrene	150		
56-55-3	Benzo(A)Anthracene	200	U	
218-01-9	Chrysene	5100		SC
205-99-2	Benzo(B)Fluoranthene	200	U	
207-08-9	Benzo(K)Fluoranthene	180	U	
192-97-2	Benzo(E)Pyrene	1700		SC
50-32-8	Benzo(A)Pyrene	180	U	
198-55-0	Perylene	200	U	
193-39-5	Indeno(1,2,3-CD)Pyrene	170	U	
53-70-3	Dibenz(A,H)Anthracene	130	U	
191-24-2	Benzo(G,H,I)Perylene	220	U	

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

20863-05MSD

Lab Name: ENSECO

Contract No.:

Lab Code: ENSECO

Case No.: 20863

SAS No.:

SDG No.:

Matrix: (soil/water) WATER

Lab Sample ID: 20863-05MSD

Sample wt/vol: 500 (g/ml) ML

Lab File ID: C5383

Level: (low/med) MED

Date Received: 02/12/92

% Moisture: not dec. dec.

Date Extracted: 02/17/92

Extraction: (SepF/Cont/Sonc) CONT

Date Analyzed: 03/23/92

GPC Cleanup: (Y/N) N pH: 7.0

Dilution Factor: 10.0

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND	Q
271-89-6	2,3-Benzofuran	U
496-11-7	2,3-Dihydroindene	
95-13-6	1H-Indene	SC
91-20-3	Naphthalene	SC
4565-32-6	Benzo(B)Thiophene	
91-22-5	Quinoline	*SC
120-72-9	1H-Indole	J
91-57-6	2-Methylnaphthalene	SC
90-12-0	1-Methylnaphthalene	
92-52-4	Biphenyl	U
208-96-8	Acenaphthylene	U
83-32-9	Acenaphthene	
132-64-9	Dibenzofuran	*
86-73-7	Fluorene	SC
132-65-0	Dibenzothiophene	U
85-01-8	Phenanthrene	
120-12-7	Anthracene	U
260-94-6	Acridine	U
86-74-8	Carbazole	U
206-44-0	Fluoranthene	
129-00-0	Pyrene	
56-55-3	Benzo(A)Anthracene	U
218-01-9	Chrysene	SC
205-99-2	Benzo(B)Fluoranthene	U
207-08-9	Benzo(K)Fluoranthene	U
192-97-2	Benzo(E)Pyrene	SC
50-32-8	Benzo(A)Pyrene	U
198-55-0	Perylene	U
193-39-5	Indeno(1,2,3-CD)Pyrene	U
53-70-3	Dibenz(A,H)Anthracene	U
191-24-2	Benzo(G,H,I)Perylene	U

2C
WATER SEMIVOLATILE SURROGATE RECOVERY

Lab Name: ENSECO

Contract:

Lab Code: ENSECO

Case No.: 20863

SAS No.:

SDG No.:

Level: LOW

	EPA SAMPLE NO.	S1 (NAP) #	S2 (FLU) #	S3 (CHR) #
1	20863-01	51	138	34
2	20863-01DL	D	D	D
3	20863-02	83	188 *	94
4	20863-02DL	D	D	D
5	20863-03	56	84	46
6	20863-03DL	D	D	D
7	20863-04	27	94	30
8	20863-04DL	D	D	D
9	20863-06	104	111	140 *
10	BLK01	113 *	120	129 *

S1 (NAP) = D8-NAPHTHALENE
S2 (FLU) = D10-FLUORENE
S3 (CHR) = D12-CHRYSENE

QC LIMITS
(14-108)
(41-162)
(10-118)

Column to be used to flag recovery values

* Values outside of contract required QC limits

D Surrogates diluted out

2C
WATER SEMIVOLATILE SURROGATE RECOVERY

Lab Name: ENSECO

Contract:

Lab Code: ENSECO

Case No.: 20863

SAS No.:

SDG No.:

Level: MED

	EPA SAMPLE NO.	S1 (NAP) #	S2 (FLU) #	S3 (CHR) #
1	20863-05	133 *	132	111
2	20863-05DU	114 *	116	95
3	20863-05MS	109 *	121	130 *
4	20863-05MSD	118 *	122	109
5	BLK02	104	119	134 *

S1 (NAP) = D8-NAPHTHALENE	QC LIMITS
S2 (FLU) = D10-FLUORENE	(14-108)
S3 (CHR) = D12-CHRYSENE	(41-162)
	(10-118)

Column to be used to flag recovery values

*** Values outside of contract required QC limits**

D Surrogates diluted out

3C
WATER SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: ENSECO

Contract:

Lab Code: ENSECO

Case No.: 20863

SAS No.:

SDG No.:

Matrix Spike - EPA Sample No.: 20863-05

LEVEL: MED

Compound	SPIKE ADDED (ng/L)	SAMPLE CONCENTRATION (ng/L)	MS CONCENTRATION (ng/L)	MS % REC
1H-Indene	4000	169	3820	91
Naphthalene	4000	225	3430	80
Quinoline	4000	ND	3940	98
2-Methylnaphthalene	4000	ND	4390	110
Fluorene	4000	112	4630	113
Chrysene	4000	ND	5090	127
Benzo(E)Pyrene	4000	ND	1690	42

Compound	SPIKE ADDED (ng/L)	MSD CONCENTRATION (ng/L)	MSD % REC	% RPD
1H-Indene	4000	4230	102	11
Naphthalene	4000	3640	85	6
Quinoline	4000	4340	108	10
2-Methylnaphthalene	4000	4120	103	6
Fluorene	4000	4830	118	4
Chrysene	4000	4310	107	17
Benzo(E)Pyrene	4000	2010	50	17

Comments:

4B
SEMIVOLATILE METHOD BLANK SUMMARY

BLK01

Lab Name: ENSECO

Contract:

Lab Code: ENSECO

Case No.: 20863

SAS No.:

SDG No.:

Lab File ID: C5364

Lab Sample ID: BLK01

Instrument ID: 4500-C

Date Extracted: 02/15/92

Matrix: (soil/water) WATER

Date Analyzed: 03/20/92

Level: (low/med) LOW

Time Analyzed: 1635

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	EPA SAMPLE NO. -----	LAB SAMPLE ID -----	LAB FILE ID -----	DATE ANALYZED -----
1	20863-01	20863-01	C5365	03/20/92
2	20863-01DL	20863-01DL	C5354	03/20/92
3	20863-02	20863-02	C5355	03/20/92
4	20863-02DL	20863-02DL	C5366	03/20/92
5	20863-03	20863-03	C5367	03/20/92
6	20863-03DL	20863-03DL	C5356	03/20/92
7	20863-04	20863-04	C5368	03/20/92
8	20863-04DL	20863-04DL	C5357	03/20/92
9	20863-06	20863-06	C5358	03/20/92

Comments:

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BLK01

Lab Name: ENSECO

Contract No.:

Lab Code: ENSECO Case No.: 20863 SAS No.:

SDG No.:

Matrix: (soil/water) WATER

Lab Sample ID: BLK01

Sample wt/vol: 4000 (g/ml) ML

Lab File ID: C5364

Level: (low/med) LOW

Date Received:

% Moisture: not dec. dec.

Date Extracted: 02/15/92

Extraction: (SepF/Cont/Sonc) CONT

Date Analyzed: 03/20/92

GPC Cleanup: (Y/N) N pH: 7.0

Dilution Factor: 0.125

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND	CONCENTRATION UNITS: NG/L	Q
271-89-6-----	2,3-Benzofuran	5.1	U
496-11-7-----	2,3-Dihydroindene	1.4	U
95-13-6-----	1H-Indene	0.9	U
91-20-3-----	Naphthalene	4.5	J
4565-32-6-----	Benzo(B)Thiophene	0.9	U
91-22-5-----	Quinoline	1.4	U
120-72-9-----	1H-Indole	2.5	U
91-57-6-----	2-Methylnaphthalene	3.7	
90-12-0-----	1-Methylnaphthalene	2.0	*
92-52-4-----	Biphenyl	4.3	U
208-96-8-----	Acenaphthylene	1.4	U
83-32-9-----	Acenaphthene	1.3	U
132-64-9-----	Dibenzofuran	1.0	*
86-73-7-----	Fluorene	1.0	U
132-65-0-----	Dibenzothiophene	1.1	U
85-01-8-----	Phenanthrene	2.8	
120-12-7-----	Anthracene	1.1	U
260-94-6-----	Acridine	2.9	U
86-74-8-----	Carbazole	1.9	U
206-44-0-----	Fluoranthene	1.4	U
129-00-0-----	Pyrene	1.4	U
56-55-3-----	Benzo(A)Anthracene	2.5	U
218-01-9-----	Chrysene	2.8	U
205-99-2-----	Benzo(B)Fluoranthene	2.5	U
207-08-9-----	Benzo(K)Fluoranthene	2.3	U
192-97-2-----	Benzo(E)Pyrene	1.9	U
50-32-8-----	Benzo(A)Pyrene	2.3	U
198-55-0-----	Perylene	2.5	U
193-39-5-----	Indeno(1,2,3-CD)Pyrene	2.1	U
53-70-3-----	Dibenz(A,H)Anthracene	1.6	U
191-24-2-----	Benzo(G,H,I)Perylene	2.8	U

4B
SEMIVOLATILE METHOD BLANK SUMMARY

BLK02

Lab Name: ENSECO

Contract:

Lab Code: ENSECO

Case No.: 20863

SAS No.:

SDG No.:

Lab File ID: C5372

Lab Sample ID: BLK02

Instrument ID: 4500-C

Date Extracted: 02/17/92

Matrix: (soil/water) WATER

Date Analyzed: 03/20/92

Level: (low/med) MED

Time Analyzed: 2341

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	-----	-----	-----	-----
1	20863-05	20863-05	C5381	03/22/92
2	20863-05DU	20863-05DU	C5382	03/23/92
3	20863-05MS	20863-05MS	C5374	03/21/92
4	20863-05MSD	20863-05MSD	C5383	03/23/92

Comments:

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BLK02

Lab Name: ENSECO

Contract No.:

Lab Code: ENSECO Case No.: 20863 SAS No.:

SDG No.:

Matrix: (soil/water) WATER

Lab Sample ID: BLK02

Sample wt/vol: 500 (g/ml) ML

Lab File ID: C5372

Level: (low/med) MED

Date Received:

% Moisture: not dec. dec.

Date Extracted: 02/17/92

Extraction: (SepF/Cont/Sonc) CONT

Date Analyzed: 03/20/92

GPC Cleanup: (Y/N) N pH: 7.0

Dilution Factor: 10.0

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND	CONCENTRATION UNITS: NG/L	Q
271-89-6	2,3-Benzofuran	410	U
496-11-7	2,3-Dihydroindene	110	U
95-13-6	1H-Indene	72	U
91-20-3	Naphthalene	520	U
4565-32-6	Benzo(B)Thiophene	72	U
91-22-5	Quinoline	110	U
120-72-9	1H-Indole	200	U
91-57-6	2-Methylnaphthalene	72	U
90-12-0	1-Methylnaphthalene	130	U
92-52-4	Biphenyl	340	U
208-96-8	Acenaphthylene	110	U
83-32-9	Acenaphthene	100	U
132-64-9	Dibenzofuran	80	U
86-73-7	Fluorene	80	U
132-65-0	Dibenzothiophene	88	U
85-01-8	Phenanthrene	100	U
120-12-7	Anthracene	88	U
260-94-6	Acridine	230	U
86-74-8	Carbazole	150	U
206-44-0	Fluoranthene	110	U
129-00-0	Pyrene	110	U
56-55-3	Benzo(A)Anthracene	200	U
218-01-9	Chrysene	220	U
205-99-2	Benzo(B)Fluoranthene	200	U
207-08-9	Benzo(K)Fluoranthene	180	U
192-97-2	Benzo(E)Pyrene	150	U
50-32-8	Benzo(A)Pyrene	180	U
198-55-0	Perylene	200	U
193-39-5	Indeno(1,2,3-CD)Pyrene	170	U
53-70-3	Dibenz(A,H)Anthracene	130	U
191-24-2	Benzo(G,H,I)Perylene	220	U

5B
SEMIVOLATILE ORGANIC GC/MS PAH

Lab Name: ENSECO

Contract No:

Lab Code: ENSECO

Case No: 20863

SAS No:

SDG No:

THIS PERFORMANCE TUNE APPLIES TO THE FOLLOWING SAMPLES, BLANKS AND STANDARDS

SAMPLE ID	LAB FILE ID	DATE OF ANALYSIS	TIME OF ANALYSIS
40 PPB PAH STD	C5341	03/18/92	1427
1200 PPB PAH STD	C5344	03/18/92	1817
240 PPB PAH STD	C5345	03/18/92	1943
20 PPB PAH STD	C5346	03/18/92	2036
600 PPB PAH STD	C5347	03/18/92	2129

5B
SEMIVOLATILE ORGANIC GC/MS PAH

Lab Name: ENSECO

Contract No:

Lab Code: ENSECO

Case No: 20863

SAS No:

SDG No:

THIS PERFORMANCE TUNE APPLIES TO THE FOLLOWING SAMPLES, BLANKS AND STANDARDS

SAMPLE ID	LAB FILE ID	DATE OF ANALYSIS	TIME OF ANALYSIS
40 PPB PAH STD	C5348	03/19/92	2318
20863-01DL	C5354	03/20/92	0510
20863-02	C5355	03/20/92	0603
20863-03DL	C5356	03/20/92	0656
20863-04DL	C5357	03/20/92	0749
20863-06	C5358	03/20/92	0842

5B
SEMIVOLATILE ORGANIC GC/MS PAH

Lab Name: ENSEC0

Contract No:

Lab Code: ENSEC0

Case No: 20863

SAS No:

SDG No:

THIS PERFORMANCE TUNE APPLIES TO THE FOLLOWING SAMPLES, BLANKS AND STANDARDS

SAMPLE ID	LAB FILE ID	DATE OF ANALYSIS	TIME OF ANALYSIS
40_PPb_PAH_STD	C5362	03/20/92	1418
BLK01	C5364	03/20/92	1635
20863-01	C5365	03/20/92	1729
20863-02DL	C5366	03/20/92	1823
20863-03	C5367	03/20/92	1916
20863-04	C5368	03/20/92	2009
BLK02	C5372	03/20/92	2341
20863-05MS	C5374	03/21/92	0128

5B
SEMIVOLATILE ORGANIC GC/MS PAH

Lab Name: ENSEC0

Contract No:

Lab Code: ENSEC0

Case No: 20863

SAS No:

SDG No:

THIS PERFORMANCE TUNE APPLIES TO THE FOLLOWING SAMPLES, BLANKS AND STANDARDS

SAMPLE ID	LAB FILE ID	DATE OF ANALYSIS	TIME OF ANALYSIS
40 PPB PAH STD	C5380	03/22/92	2207
20863-05	C5381	03/22/92	2338
20863-05DU	C5382	03/23/92	0033
20863-05MSD	C5383	03/23/92	0126

6B
INITIAL CALIBRATION DATA
PAH COMPOUNDS

Lab Name: ENECO

Lab Code: ENECO

Case No: 20863

Instrument ID: 4500-C

Calibration Date(s): 03/18/92

Maximum % RSD is 35%

Lab File ID: RRF 240= C5345		RRF 20= C5346 RRF 600= C5347		RRF 40= C5341 RRF 1200= C5344			
COMPOUND	20 PPB RRF	40 PPB RRF	240PPB RRF	600PPB RRF	1200PPB RRF	AVE RRF	%RSD
2,3-Benzofuran	1.544	1.010	1.124	1.083	1.121	1.176	17.9
2,3-Dihydroindene	1.368	0.884	0.989	0.964	1.002	1.041	18.1
1H-Indene	1.058	0.741	0.874	0.865	0.914	0.890	12.8
Naphthalene	2.170	1.782	1.968	1.953	1.622	1.899	10.9
Benzo(B)Thiophene	1.367	1.252	1.439	1.425	1.385	1.374	5.4
Quinoline	0.777	0.704	0.757	0.790	0.867	0.779	7.6
1H-Indole	0.839	0.676	0.909	0.939	1.044	0.881	15.5
2-Methylnaphthalene	0.853	0.741	0.837	0.831	0.880	0.828	6.3
1-Methylnaphthalene	0.876	0.809	0.899	0.910	0.952	0.889	5.9
Biphenyl	1.122	1.054	1.171	1.167	1.178	1.138	4.6
Acenaphthylene	1.275	1.184	1.410	1.506	1.509	1.377	10.4
Acenaphthene	0.873	0.812	0.911	0.946	0.999	0.908	7.8
Dibenzofuran	1.479	1.376	1.515	1.565	1.509	1.489	4.7
Fluorene	1.100	1.041	1.175	1.225	1.289	1.166	8.4
Dibenzothiophene	0.758	0.700	0.798	0.795	0.720	0.754	5.8
Phenanthrene	1.029	0.896	0.985	0.978	0.868	0.951	7.0
Anthracene	0.775	0.710	0.842	0.891	0.843	0.812	8.7
Acridine	0.497	0.469	0.501	0.549	0.577	0.519	8.4
Carbazole	0.620	0.552	0.656	0.703	0.694	0.645	9.5
Fluoranthene	0.968	0.851	1.004	1.008	0.889	0.944	7.5
Pyrene	1.321	1.008	1.183	1.052	0.937	1.100	13.9
Benzo(A)Anthracene	0.959	0.829	0.994	0.968	1.060	0.962	8.8
Chrysene	1.059	0.911	0.976	0.980	1.072	1.000	6.6
Benzo(B)Fluoranthene	1.152	1.022	1.127	1.119	1.170	1.118	5.1
Benzo(K)Fluoranthene	1.003	0.881	1.039	0.958	1.095	0.995	8.2
Benzo(E)Pyrene	0.998	0.886	0.985	0.927	1.006	0.960	5.4
Benzo(A)Pyrene	1.031	0.837	0.968	0.871	0.971	0.936	8.5
Perylene	0.675	0.608	0.668	0.674	0.756	0.676	7.8
Indeno(1,2,3-CD)Pyrene	0.962	0.853	0.981	0.971	1.069	0.967	7.9
Dibenz(A,H)Anthracene	0.874	0.748	0.850	0.872	0.969	0.863	9.1
Benzo(G,H,I)Perylene	0.950	0.819	0.920	0.886	0.961	0.907	6.3
=====	=====	=====	=====	=====	=====	=====	=====
D8-Naphthalene	1.736	1.571	1.784	1.775	1.573	1.688	6.4
D10-Flourene	0.962	0.916	1.002	1.043	1.106	1.006	7.3
D12-Chrysene	0.940	0.816	0.868	0.884	1.000	1.176	7.8

7B
CONTINUING CALIBRATION DATA
PAH COMPOUNDS

Lab Name: ENSECO

Lab Code: ENSECO

Case No: 20863

Instrument ID: 4500-C

Calibration Date(s): 03/19/92

Time: 2318

Lab ID: C5348

Initial Calibration Date: 03/18/92

Maximum %D is 35%

COMPOUND	INITIAL AVE RRF	40 PPB RRF	%D
2,3-Benzofuran	1.176	0.974	17.2
2,3-Dihydroindene	1.041	0.875	15.9
1H-Indene	0.890	0.723	18.8
Naphthalene	1.899	1.717	9.6
Benzo(B)Thiophene	1.374	1.245	9.4
Quinoline	0.779	0.643	17.5
1H-Indole	0.881	0.630	28.5
2-Methylnaphthalene	0.828	0.732	11.6
1-Methylnaphthalene	0.889	0.793	10.8
Biphenyl	1.138	1.035	9.1
Acenaphthylene	1.377	1.125	18.3
Acenaphthene	0.908	0.793	12.7
Dibenzofuran	1.489	1.363	8.5
Fluorene	1.166	1.015	13.0
Dibenzothiophene	0.754	0.704	6.6
Phenanthrene	0.951	0.896	5.8
Anthracene	0.812	0.696	14.3
Acridine	0.519	0.436	16.0
Carbazole	0.645	0.531	17.7
Fluoranthene	0.944	0.850	10.0
Pyrene	1.100	1.004	8.7
Benzo(A)Anthracene	0.962	0.811	15.7
Chrysene	1.000	0.931	6.9
Benzo(B)Fluoranthene	1.118	1.043	6.7
Benzo(K)Fluoranthene	0.995	0.856	14.0
Benzo(E)Pyrene	0.960	0.912	5.0
Benzo(A)Pyrene	0.936	0.833	11.0
Perylene	0.676	0.562	16.9
Indeno(1,2,3-CD)Pyrene	0.967	0.836	13.5
Dibenz(A,H)Anthracene	0.863	0.741	14.1
Benzo(G,H,I)Perylene	0.907	0.838	7.6
=====	=====	=====	=====
D8-Naphthalene	1.688	1.526	9.6
D10-Flourene	1.006	0.908	9.7
D12-Chrysene	0.902	0.817	9.4

7B
CONTINUING CALIBRATION DATA
PAH COMPOUNDS

Lab Name: ENSECO

Lab Code: ENSECO

Case No: 20863

Instrument ID: 4500-C

Calibration Date(s): 03/20/92

Time: 1418

Lab ID: C5362

Initial Calibration Date: 03/18/92

Maximum %D is 35%

COMPOUND	INITIAL AVE RRF	40 PPB RRF	%D
2,3-Benzofuran	1.176	0.867	26.3
2,3-Dihydroindene	1.041	0.831	20.2
1H-Indene	0.890	0.666	25.2
Naphthalene	1.899	1.788	5.8
Benzo(B)Thiophene	1.374	1.153	16.1
Quinoline	0.779	0.681	12.6
1H-Indole	0.881	0.582	33.9
2-Methylnaphthalene	0.828	0.702	15.2
1-Methylnaphthalene	0.889	0.736	17.2
Biphenyl	1.138	1.104	3.0
Acenaphthylene	1.377	1.097	20.3
Acenaphthene	0.908	0.850	6.4
Dibenzofuran	1.489	1.286	13.6
Fluorene	1.166	0.977	16.2
Dibenzothiophene	0.754	0.903	-19.8
Phenanthrene	0.951	0.864	9.1
Anthracene	0.812	0.663	18.3
Acridine	0.519	0.484	6.7
Carbazole	0.645	0.567	12.1
Fluoranthene	0.944	0.926	1.9
Pyrene	1.100	1.121	-1.9
Benzo(A)Anthracene	0.962	0.864	10.2
Chrysene	1.000	0.978	2.2
Benzo(B)Fluoranthene	1.118	1.087	2.8
Benzo(K)Fluoranthene	0.995	0.979	1.6
Benzo(E)Pyrene	0.960	0.993	-3.4
Benzo(A)Pyrene	0.936	0.906	3.2
Perylene	0.676	0.662	2.1
Indeno(1,2,3-CD)Pyrene	0.967	0.916	5.3
Dibenz(A,H)Anthracene	0.863	0.829	3.9
Benzo(G,H,I)Perylene	0.907	0.907	0.0
-----	-----	-----	-----
D8-Naphthalene	1.688	1.392	17.5
D10-Flourene	1.006	0.815	19.0
D12-Chrysene	0.902	0.820	9.1

7B
CONTINUING CALIBRATION DATA
PAH COMPOUNDS

Lab Name: ENECO

Lab Code: ENECO

Case No: 20863

Instrument ID: 4500-C

Calibration Date(s): 03/22/92

Time: 2207

Lab ID: C5380

Initial Calibration Date: 03/18/92

Maximum %D is 35%

COMPOUND	INITIAL AVE RRF	40 PPB RRF	%D
2,3-Benzofuran	1.176	0.878	25.3
2,3-Dihydroindene	1.041	0.913	12.3
1H-Indene	0.890	0.666	25.2
Naphthalene	1.899	1.812	4.6
Benzo(B)Thiophene	1.374	1.133	17.5
Quinoline	0.779	0.688	11.7
1H-Indole	0.881	1.028	-16.7
2-Methylnaphthalene	0.828	0.766	7.5
1-Methylnaphthalene	0.889	0.763	14.2
Biphenyl	1.138	1.126	1.1
Acenaphthylene	1.377	1.112	19.2
Acenaphthene	0.908	0.848	6.6
Dibenzofuran	1.489	1.214	18.5
Fluorene	1.166	0.966	17.2
Dibenzothiophene	0.754	0.912	-21.0
Phenanthrene	0.951	1.050	-10.4
Anthracene	0.812	0.811	0.1
Acridine	0.519	0.530	-2.1
Carbazole	0.645	0.681	-5.6
Fluoranthene	0.944	0.995	-5.4
Pyrene	1.100	1.209	-9.9
Benzo(A)Anthracene	0.962	1.195	-24.2
Chrysene	1.000	1.276	-27.6
Benzo(B)Fluoranthene	1.118	1.258	-12.5
Benzo(K)Fluoranthene	0.995	0.995	0.0
Benzo(E)Pyrene	0.960	1.083	-12.8
Benzo(A)Pyrene	0.936	0.922	1.5
Perylene	0.676	0.704	-4.1
Indeno(1,2,3-CD)Pyrene	0.967	0.914	5.5
Dibenz(A,H)Anthracene	0.863	0.827	4.2
Benzo(G,H,I)Perylene	0.907	0.924	-1.9
-----	-----	-----	-----
D8-Naphthalene	1.688	1.297	23.2
D10-Fluorene	1.006	0.779	22.6
D12-Chrysene	0.902	0.920	-2.0

8C
SEMIVOLATILE INTERNAL STANDARD AREA SUMMARY

Lab Name: ENSECO

Contract:

Lab Code: ENSECO

Case No: 20863

SAS No.:

SDG No:

Lab File ID (Standard): C5348

Date Analyzed: 03/19/92

Instrument ID: 4500-C

Time Analyzed: 2318

	IS#1 (ACN) AREA #	IS#2 (PHN) AREA #	IS#3 (BAP) AREA #
-----	-----	-----	-----
12 HOUR STD	262000	441000	380000
-----	-----	-----	-----
UPPER LIMIT	524000	882000	760000
-----	-----	-----	-----
LOWER LIMIT	131000	220000	190000
-----	-----	-----	-----
SAMPLE NO.			
-----	-----	-----	-----
20863-01DL	209000	371000	330000
20863-02	226000	420000	370000
20863-03DL	226000	403000	344000
20863-04DL	192000	341000	297000
20863-06	221000	386000	312000

IS#1 (ACN) = D10-ACENAPHTHENE
IS#2 (PHN) = D10-PHENANTHRENE
IS#3 (BAP) = D12-BENZO(A)PYRENE

UPPER LIMIT = + 100%
of internal standard area
LOWER LIMIT = - 50%
of internal standard area

Column used to flag internal standard area values with an asterisk

8C
SEMIVOLATILE INTERNAL STANDARD AREA SUMMARY

Lab Name: ENSECO

Contract:

Lab Code: ENSECO

Case No: 20863

SAS No.:

SDG No:

Lab File ID (Standard): C5362

Date Analyzed: 03/20/92

Instrument ID: 4500-C

Time Analyzed: 1418

	IS#1 (ACN) AREA #	IS#2 (PHN) AREA #	IS#3 (BAP) AREA #
-----	-----	-----	-----
12 HOUR STD	195000	290000	270000
-----	-----	-----	-----
UPPER LIMIT	390000	580000	540000
-----	-----	-----	-----
LOWER LIMIT	98000	145000	135000
-----	-----	-----	-----
SAMPLE NO.			
-----	-----	-----	-----
20863-01	268000	454000	337000
20863-02DL	227000	364000	283000
20863-03	112000	160000	142000
20863-04	290000	405000	288000
20863-05MS	148000	220000	140000
BLK01	359000	561000	422000
BLK02	153000	230000	161000

IS#1 (ACN) = D10-ACENAPHTHENE
IS#2 (PHN) = D10-PHENANTHRENE
IS#3 (BAP) = D12-BENZO(A)PYRENE

UPPER LIMIT = + 100%
of internal standard area
LOWER LIMIT = - 50%
of internal standard area

Column used to flag internal standard area values with an asterisk

8C
SEMIVOLATILE INTERNAL STANDARD AREA SUMMARY

Lab Name: ENSECO

Contract:

Lab Code: ENSECO

Case No: 20863

SAS No.:

SDG No:

Lab File ID (Standard): C5380

Date Analyzed: 03/22/92

Instrument ID: 4500-C

Time Analyzed: 2207

	IS#1 (ACN) AREA #	IS#2 (PHN) AREA #	IS#3 (BAP) AREA #
-----	-----	-----	-----
12 HOUR STD	341000	484000	319000
-----	-----	-----	-----
UPPER LIMIT	682000	968000	638000
-----	-----	-----	-----
LOWER LIMIT	170000	242000	160000
-----	-----	-----	-----
SAMPLE NO.			
-----	-----	-----	-----
20863-05	217000	317000	192000
20863-05DU	222000	329000	217000
20863-05MSD	260000	397000	266000

IS#1 (ACN) = D10-ACENAPHTHENE
IS#2 (PHN) = D10-PHENANTHRENE
IS#3 (BAP) = D12-BENZO(A)PYRENE

UPPER LIMIT = + 100%
of internal standard area
LOWER LIMIT = - 50%
of internal standard area

Column used to flag internal standard area values with an asterisk

RAP SECTION 6.1.4. MONITORING

2ND QUARTER - 1992

SLP



CASE NARRATIVE

FOR

City of St. Louis Park

August 13, 1992

Enseco - RMAL Project Number 023144

Introduction

Eighteen aqueous samples (includes QC) were received at Enseco Rocky Mountain Analytical Laboratory on June 03, 1992. The samples were logged in under RMAL project number 023144. Sample PCJ-SLP10FBD-060292 was extracted and held per the April 1990 QAPP. A cross reference associating the RMAL sample numbers to the actual field sample numbers is included. The samples were analyzed for low level part-per-trillion (ppt) polynuclear aromatic hydrocarbons (PAH).

Data Quality Assessment

The results contained in this report were reviewed relative to data acceptance criteria as specified in the April, 1990 QAPP for completeness, precision, accuracy, representativeness and defensibility of the data. Unless otherwise stated below, no quality control problems or technical difficulties were encountered which would impact the interpretation or use of data in this report.

PPT PAH

Sample 023144-BLK02, -BLK03, and -0002DL showed a surrogate which exceeded the upper control limits. All instrument calibration, surrogate standard concentration, etc. were checked and found to be in control. It has been concluded that an interference specific to the surrogate is present which resulted in the high recoveries. This interference does not affect the quantitation of target components.

Case Narrative - RMAL #023144
August 13, 1992
Page Two

23144-001MS/SD matrix spike percent recovery for Quinoline was reported outside of QC limits, due to the concentration of this component in the initial sample. The percent recovery for Benzo(E)Pyrene was less than 10% for this sample also. Contractually it is allowed to have one percent recovery below the minimum QC limit, since good recovery was achieved for all other spike components (between the range of 50-100%), quantitation was checked and no further action was taken.

23144-002MS/SD matrix spike percent recovery / RPD recoveries for Florene, 1H-Indene, and Quinoline were reported outside of QC limits, due to the concentration of those components in the initial sample. Since good recovery was achieved for all other spike components (between the range of 50-100%), quantitation was checked and no further action was taken.

Samples 023144-0001, -0002, -0003, -0004, -0005, -0006, -0007, -0008, -0009, and -0010 show target compounds above the upper calibration range. The samples were reanalyzed at dilutions. Both the original and reanalysis data are reported for each sample. Surrogates could not be measured in sample 23144-0008 due to the level of dilutions performed.

Sample 023144-0009 was initially analyzed within analytical holding times but at an inappropriate dilution. This sample was analyzed at a proper cocentration outside of analytical holding times.

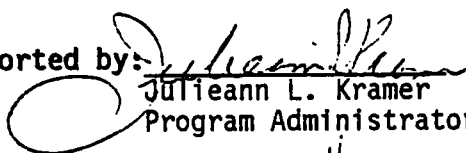
The 4800 ng/ml and the 2400 ng/ml standards had excessive saturation, therefore they were not used as the upper range for the 5-point calibration curve. Instead, the calibration curve used was, 20 ng/ml, 40 ng/ml, 240 ng/ml, 600 ng/ml, and 1200 ng/ml.

All samples associated with project 023144 show target compounds that do not meet secondary ion confirmation. In some instances a compound that does not meet secondary ion confirmation criteria may still be determined to be present in the sample after close inspection of the data by the analyst. Supportive data includes mass chromatograms maxima at the same scan for primary and secondary ions, as well as discernible quantitation interference with the secondary ion. These compounds are flagged with the letter (R) on the data sheets (Form I) as per the 1990 QAPP.

Case Narrative - RMAL #023144
August 13, 1992
Page Three

This data package is in compliance with the terms and conditions of the 1990 QAPP, both technically and for completeness, for other than the conditions detailed above.


Reported by:


Julieann L. Kramer
Program Administrator

Date:

Aug 13, 1992

Approved by:


Mark Dymerski
Technical Manager

Date:

8-13-92



Qualifier Codes and Their Usage

- U** = Indicates compound was analyzed for but not detected. The sample quantitation limit must be corrected for dilution and for percent moisture. For example, 10 U for phenol in water if the sample final volume is the protocol-specified final volume. If a 1 to 10 dilution of extract is necessary, the reported limit is 100 U. For a soil sample, the value must also be adjusted for percent moisture.
- J** = Indicates an estimated value. This flag is used either when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed, or when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the sample quantitation limit but greater than zero. For example, if the sample quantitation limit is 10 ug/L, but a concentration of 3 ug/L is calculated, report it as 3J. The sample quantitation limit must be adjusted for dilution as discussed for the U flag.
- N** = Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds, where the identification is based on a mass spectral library search. It is applied to all TIC results.
- P** = This flag is used for a pesticide/Aroclor target analyte when there is greater than 25% difference for detected concentrations between the two GC columns (see Form X). The lower of the two values is reported on Form I and flagged with a "P".
- C** = This flag applies to pesticide results where the identification has been confirmed by GC/MS. If GC/MS confirmation was attempted but was unsuccessful, do not apply this flag, instead use a laboratory-defined flag, discussed below.
- B** = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action. This flag must be used for a TIC as well as for a positively identified target compound.



Qualifier Codes and Their Usage

Page Two

- E** = This flag identifies compounds whose concentrations exceed the calibration range of the GC/MS instrument for that specific analysis. If one or more compounds have a response greater than full scale, except as noted in Exhibit D, the sample or extract must be diluted and re-analyzed accordingly to the specifications in Exhibit D. All such compounds with a response greater than full scale should have the concentration flagged with an "E" on the Form I for the original analysis. If the dilution of the extract causes any compounds identified in the first analysis to be below the calibration range in the second analysis, then the results of both analyses shall be reported on separate copies of Form I. The Form I for the diluted sample shall have the "DL" suffix appended to the sample number. NOTE: For total xylenes, where three isomers are quantified as two peaks, the calibration range of each peak should be considered separately, e.g., a diluted analysis is not required for total xylenes unless the concentration of either peak separately exceeds 200 ug/L.
- D** = This flag identifies all compounds identified in an analysis at a secondary dilution factor. If a sample or extract is re-analyzed at a higher dilution factor, as in the "E" flag above, the "DL" suffix is appended to the sample number on the Form I for the diluted sample, and all concentration values reported on that Form I are flagged with the "D" flag. This flag alerts data users that any discrepancies between the concentrations reported may be due to dilution of the sample or extract.
- A** = This flag indicates that a TIC is a suspected aldol-condensation product.
- X** = Other specific flags may be required to properly define the results. If used, they must be fully described, and such description attached to the Sample Data Summary Package and the SDG Narrative. Begin by using "X". If more than one flag is required, use "Y" and "Z" as needed. If more than five qualifiers are required for a sample result, use the "X" flag to combine several flags, as needed. For instance, the "X" flag might combine the "A", "B", and "D" flags for some sample. The laboratory-defined flags are limited to the letters "X", "Y", and "Z".
- R** = Target compound's secondary ion confirmation criteria not met, but retention time and peak shape make identification possible.

SAMPLE DESCRIPTION INFORMATION
for
City of St. Louis Park

Lab ID	Client ID	Matrix	Sampled Date	Time	Received Date
023144-0001-SA	PCJ-SLP10-060292 ✓	AQUEOUS	02 JUN 92		03 JUN 92
023144-0001-DU	PCJ-SLP10D-060292 ✓	AQUEOUS	02 JUN 92		03 JUN 92
023144-0001-MS	PCJ-SLP10MS-060292	AQUEOUS	02 JUN 92		03 JUN 92
023144-0001-SD	PCJ-SLP10MSD-060292	AQUEOUS	02 JUN 92		03 JUN 92
023144-0002-SA	PCJ-SLP10-060292	AQUEOUS	02 JUN 92		03 JUN 92
023144-0002-DU	PCJ-SLP10D-060292	AQUEOUS	02 JUN 92		03 JUN 92
023144-0002-MS	PCJ-SLP10MS-060292 -	AQUEOUS	02 JUN 92		03 JUN 92
023144-0002-SD	PCJ-SLP10MSD-060292	AQUEOUS	02 JUN 92		03 JUN 92
023144-0003-SA	STP-W24-060292	AQUEOUS	02 JUN 92	16:10	03 JUN 92
023144-0004-SA	PCJ-W403-060292 ✓	AQUEOUS	02 JUN 92	13:33	03 JUN 92
023144-0005-SA	PCJ-W403-060292 ✓	AQUEOUS	02 JUN 92	13:33	03 JUN 92
023144-0006-SA	IGV-W105-060292 ✓	AQUEOUS	02 JUN 92		03 JUN 92
023144-0007-SA	IGV-W105-060292 ✓	AQUEOUS	02 JUN 92		03 JUN 92
023144-0008-SA	STP-W24-060292	AQUEOUS	02 JUN 92	16:10	03 JUN 92
023144-0009-SA	PCJ-W402-060292 ✓	AQUEOUS	02 JUN 92	12:48	03 JUN 92
023144-0010-SA	PCJ-W402-060292 ✓	AQUEOUS	02 JUN 92	12:48	03 JUN 92
023144-0011-SA	PCJ-SLP10FB-060292	AQUEOUS	02 JUN 92		03 JUN 92
023144-0012-SA	PCJ-SLP10FBD-060292	AQUEOUS	02 JUN 92		03 JUN 92

BLK-1
2
3
4
5

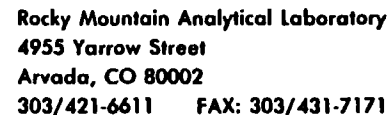
ANALYTICAL TEST REQUESTS
for
City of St. Louis Park

Lab ID: 023144	Group Code	Analysis Description	Custom Test?
0002 , 0005, 0007 - 0009, 0011	A-5	Polynuclear Aromatic Hydrocarbons, SIM Low Level Prep - PAH/SIM by GC/MS Low Level	N N
0012	B	Prep - PAH/SIM by GC/MS Low Level	N
0001 , 0003, 0004 , 0006, 0010	C 75	Polynuclear Aromatic Hydrocarbons, SIM Low Level Prep - PAH/SIM by GC/MS Low Level	N N

TABLE OF CONTENTS
FOR
CITY OF ST. LOUIS PARK
RMAL PROJECT# 023144

PPT-PAH

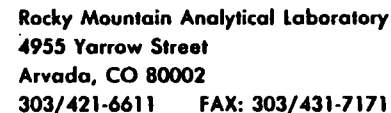
QC Summary.....	0001
Sample Data.....	0024
Standards Data.....	0834
Raw QC Data.....	1475



ENSECO CLIENT <i>CITY OF ST LOUIS PARK WATER DEPT</i>		PACKED BY <i>MJH</i>		SEAL NUMBER
PROJECT		SEAL INTACT UPON RECEIPT BY SAMPLING COMPANY		CONDITION OF CONTENTS
SAMPLING COMPANY		SEALED FOR SHIPPING BY <i>MJH</i>		INITIAL CONTENTS TEMP. °C
SAMPLING SITE <i>SAME</i>		SEAL NUMBER	SAMPLING STATUS <input type="checkbox"/> Done <input type="checkbox"/> Continuing Until	
TEAM LEADER <i>JD</i>		SEAL INTACT UPON RECEIPT BY LAB. <input type="checkbox"/> Yes <input type="checkbox"/> No		CONTENTS TEMPERATURE UPON RECEIPT BY LAB. °C

[illegible]

CUSTODY TRANSFERS PRIOR TO SHIPPING				SHIPPING DETAILS			
RELINQUISHED BY (SIGNED)	RECEIVED BY (SIGNED)	DATE	TIME	DELIVERED TO SHIPPER BY 777 R			
				METHOD OF SHIPMENT FEDEX			AIRBILL NUMBER 2103420351
				RECEIVED FOR LAB RMA	SIGNED B. MUSIL	830	DATE/TIME 6-3-92
				ENSECO PROJECT NUMBER 23144			



ENSECO CLIENT <i>CITY OF ST LOUIS PARK WATER DEPT</i>		PACKED BY <i>MIZR</i>		SEAL NUMBER	
PROJECT		SEAL INTACT UPON RECEIPT BY SAMPLING COMPANY		CONDITION OF CONTENTS	
SAMPLING COMPANY		SEALED FOR SHIPPING BY <i>MIZR</i>		INITIAL CONTENTS TEMP. °C	
SAMPLING SITE <i>SAME</i>		SEAL NUMBER		SAMPLING STATUS <input type="checkbox"/> Done <input type="checkbox"/> Continuing Until	
TEAM LEADER <i>MIZR</i>		SEAL INTACT UPON RECEIPT BY LAB. <input type="checkbox"/> Yes <input type="checkbox"/> No		CONTENTS TEMPERATURE UPON RECEIPT BY LAB. °C	

[illegible]

CUSTODY TRANSFERS PRIOR TO SHIPPING				SHIPPING DETAILS		
RELINQUISHED BY (SIGNED)	RECEIVED BY (SIGNED)	DATE	TIME	DELIVERED TO SHIPPER BY M2R		
				METHOD OF SHIPMENT FED EXP	AIRBILL NUMBER 2103420351	
				RECEIVED FOR LAB Rmal	SIGNED B. MUSIL	DATE/TIME 830 6-3-92
				ENSECO PROJECT NUMBER 03144		



Rocky Mountain Analytical Laboratory
4955 Yarrow Street
Arvada, CO 80002
303/421-6611 FAX: 303/431-7171

CHAIN OF CUSTODY

ENSECO CLIENT CITY OF ST LOUIS PARK (WATER DEPT)		SAMPLE SAFE™ CONDITIONS PACKED BY MZK	
PROJECT SAME		SEAL INTACT UPON RECEIPT BY SAMPLING COMPANY SEaled FOR SHIPPING BY MZK	
SAMPLING COMPANY SAME		SEAL NUMBER SAMPLING STATUS <input type="checkbox"/> Done <input type="checkbox"/> Continuing Until	
SAMPLING SITE SAME		SEAL INTACT UPON RECEIPT BY LAB. <input type="checkbox"/> Yes <input type="checkbox"/> No	
TEAM LEADER Michael J. Higgins		CONTENTS TEMPERATURE UPON RECEIPT BY LAB. °C	

DATE	TIME	SAMPLE ID/DESCRIPTION	SAMPLE TYPE	# CONTAINERS	ANALYSIS PARAMETERS	REMARKS
6-2-92		PCT-SLP10-060292 3	IXL AMBER	6	PPT PAH	PPT 5 A
6-2-92		PCT-SLP10-060292 2DU	IXL AMBER	6	PPT PAH	PPT 5 A

CUSTODY TRANSFERS PRIOR TO SHIPPING					SHIPPING DETAILS			
RELINQUISHED BY (SIGNED)	RECEIVED BY (SIGNED)	DATE	TIME	DELIVERED TO SHIPPER BY MZK	METHOD OF SHIPMENT FEDEX		AIRBILL NUMBER 2103420351	
				RECEIVED FOR LAB R MAL	SIGNED B. MUSIL		DATE/TIME 830 6-3-92	
				ENSECO PROJECT NUMBER 23144				



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Arvada, CO 80002
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CHAIN OF CUSTODY

ENSECO CLIENT <i>CITY OF ST LOUIS PARK WATER DEPT</i>		SAMPLE SAFE™ CONDITIONS	
PROJECT		PACKED BY <i>7/2/92</i>	SEAL NUMBER
SAMPLING COMPANY <i>SAIPE</i>		SEAL INTACT UPON RECEIPT BY SAMPLING COMPANY	CONDITION OF CONTENTS
SAMPLING SITE <i>SPIDE</i>		SEALED FOR SHIPPING BY <i>7/2/92</i>	INITIAL CONTENTS TEMP. °C
TEAM LEADER <i>7/2/92</i>		SEAL NUMBER	SAMPLING STATUS <input type="checkbox"/> Done <input type="checkbox"/> Continuing Until
		SEAL INTACT UPON RECEIPT BY LAB. <input type="checkbox"/> Yes <input type="checkbox"/> No	CONTENTS TEMPERATURE UPON RECEIPT BY LAB. °C

DATE	TIME	SAMPLE ID/DESCRIPTION	SAMPLE TYPE	# CONTAINERS	ANALYSIS PARAMETERS	REMARKS
6-2-92		PCJ-SLP10MS-060292 07m	IXLAMBER	6	PPT PAH	PPT 5 A
6-2-92		PCJ-SLP10MSD-060292 0750	IXLAMBER	6	PPT PAH	PPT 5 A

CUSTODY TRANSFERS PRIOR TO SHIPPING				SHIPPING DETAILS			
RELINQUISHED BY (SIGNED)	RECEIVED BY (SIGNED)	DATE	TIME	DELIVERED TO SHIPPER BY <i>7/2/92</i>		METHOD OF SHIPMENT <i>FED EXP</i>	
				RECEIVED FOR LAB <i>Rmal</i>		AIRBILL NUMBER <i>2103420351</i>	
				SIGNED <i>B. MUSIL</i>		DATE/TIME <i>6-7-92</i>	
				ENSECO PROJECT NUMBER <i>2312/4</i>			



Rocky Mountain Analytical Laboratory
4955 Yarrow Street
Arvada, CO 80002
303/421-6611 FAX: 303/431-7171

CHAIN OF CUSTODY

ENSECO CLIENT <i>City of St Louis Park</i>		SAMPLE SAFE™ CONDITIONS	
PROJECT <i>ENSR Consulting & Engineering</i>		PACKED BY <i>David W Jacobson</i>	SEAL NUMBER <i>ENSECO seal, no #</i>
SAMPLING COMPANY <i>W403 and W24</i>		SEAL INTACT UPON RECEIPT BY SAMPLING COMPANY <i>David W Jacobson</i>	CONDITION OF CONTENTS "
SAMPLING SITE <i>Dave Jacobson</i>		SEALED FOR SHIPPING BY	INITIAL CONTENTS TEMP. °C
TEAM LEADER		SEAL NUMBER	SAMPLING STATUS <input type="checkbox"/> Done <input type="checkbox"/> Continuing Until
		SEAL INTACT UPON RECEIPT BY LAB. <input type="checkbox"/> Yes <input type="checkbox"/> No	CONTENTS TEMPERATURE UPON RECEIPT BY LAB. °C

DATE	TIME	SAMPLE ID/DESCRIPTION	SAMPLE TYPE	# CONTAINERS	ANALYSIS PARAMETERS	REMARKS
6-2-92	1110	STP-W24-060292 ⁰³		6	ppt PAH	ppt-75 RL
6-2-92	1333	PCT-W403-060292 ⁰⁴		6	ppt PAH	ppt-75 RL
6-2-92	1333	PCT-W403-060292 ^{*05}		6	ppt PAH	ppt-5
		* ppt-75 for this well sent in other cooler				

CUSTODY TRANSFERS PRIOR TO SHIPPING

SHIPPING DETAILS

RELINQUISHED BY (SIGNED) <i>David W Jacobson</i>	RECEIVED BY (SIGNED)	DATE <i>6-2-92</i>	TIME <i>1730</i>	DELIVERED TO SHIPPER BY <i>Dave Jacobson</i>	METHOD OF SHIPMENT <i>FED EX</i>	AIRBILL NUMBER <i>2103420351</i>
<i>to Fed X</i>				RECEIVED FOR LAB <i>RNAL</i>	SIGNED <i>B. MUSIL</i>	DATE/TIME <i>830 6-3-92</i>
				ENSECO PROJECT NUMBER <i>23144</i>		



Rocky Mountain Analytical Laboratory
4955 Yarrow Street
Arvada, CO 80002
303/421-6611 FAX: 303/431-7171

CHAIN OF CUSTODY

ENSECO CLIENT CITY OF ST LOUIS PARK (WATER DEPT)		SAMPLE SAFE™ CONDITIONS	
PROJECT		PACKED BY 742X	SEAL NUMBER
SAMPLING COMPANY SAME		SEAL INTACT UPON RECEIPT BY SAMPLING COMPANY	CONDITION OF CONTENTS
SAMPLING SITE SAME		SEALED FOR SHIPPING BY 742X	INITIAL CONTENTS TEMP. °C
TEAM LEADER Michael J. Higgins		SEAL NUMBER	SAMPLING STATUS <input type="checkbox"/> Done <input type="checkbox"/> Continuing Until
		SEAL INTACT UPON RECEIPT BY LAB. <input type="checkbox"/> Yes <input type="checkbox"/> No	CONTENTS TEMPERATURE UPON RECEIPT BY LAB. °C

DATE	TIME	SAMPLE ID/DESCRIPTION	SAMPLE TYPE	# CONTAINERS	ANALYSIS PARAMETERS	REMARKS
6-1-92		PCJ-SLPICFB-060292	IXLAMBER	6	PPT PAH	PPT 75
6-2-92		PCJ-SLPICFB-060292	IXLAMBER	6	PPT PAH	PPT 75
6-2-92		IGV PCJ-WIOS-060292	IXLAMBER	6	PPT PAH	PPT 75
Dropped 6 PPT 75 field blank field blank by						

CUSTODY TRANSFERS PRIOR TO SHIPPING				SHIPPING DETAILS			
RELINQUISHED BY (SIGNED)	RECEIVED BY (SIGNED)	DATE	TIME	DELIVERED TO SHIPPER BY 742X		AIRBILL NUMBER 2103420351	
				METHOD OF SHIPMENT FEDEX			
				RECEIVED FOR LAB RMAC	SIGNED B. MUSIL	830	DATE/TIME 6-3-92
				ENSECO PROJECT NUMBER 230242			



Rocky Mountain Analytical Laboratory
4955 Yarrow Street
Arvada, CO 80002
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CHAIN OF CUSTODY

ENSECO CLIENT <i>CITY OF ST LOUIS PARK WATER DEPT</i>		SAMPLE SAFE™ CONDITIONS	
PROJECT		PACKED BY <i>MZ</i>	SEAL NUMBER
SAMPLING COMPANY		SEAL INTACT UPON RECEIPT BY SAMPLING COMPANY	CONDITION OF CONTENTS
SAMPLING SITE <i>SAIPE</i>		SEALED FOR SHIPPING BY <i>MZ</i>	INITIAL CONTENTS TEMP. °C
TEAM LEADER <i>MZ</i>		SEAL NUMBER	SAMPLING STATUS <input type="checkbox"/> Done <input type="checkbox"/> Continuing Until
		SEAL INTACT UPON RECEIPT BY LAB. <input type="checkbox"/> Yes <input type="checkbox"/> No	CONTENTS TEMPERATURE UPON RECEIPT BY LAB. °C

DATE	TIME	SAMPLE ID/DESCRIPTION	SAMPLE TYPE	# CONTAINERS	ANALYSIS PARAMETERS	REMARKS
6-2-92		PCJ-SLP10FA-060292 <i>2 AB</i>	1X LAMBER	6	PPT PAH	PPT 5 A
6-2-92		PCJ-SLP10FBD-060292 <i>2 FBD</i>	1X LAMBER	6	PPT PAH	PPT 5 A
6-2-92		IGV-W105-060292 <i>07</i>	1X LAMBER	6	PPT PAH	PPT 5 A

CUSTODY TRANSFERS PRIOR TO SHIPPING				SHIPPING DETAILS			
RELINQUISHED BY (SIGNED)	RECEIVED BY (SIGNED)	DATE	TIME	DELIVERED TO SHIPPER BY <i>MZ</i>			
				METHOD OF SHIPMENT <i>FED EXP</i>		AIRBILL NUMBER <i>2103420351</i>	
				RECEIVED FOR LAB <i>RmAL</i>	SIGNED <i>B. MUSIL</i>	<i>830</i>	DATE/TIME <i>6-3-92</i>
				ENSECO PROJECT NUMBER <i>231244</i>			



Rocky Mountain Analytical Laboratory
4955 Yarrow Street
Arvada, CO 80002
303/421-6611 FAX: 303/431-7171

CHAIN OF CUSTODY

ENSECO CLIENT City of St Louis Park PROJECT ZNSR Consulting and Engineering SAMPLING COMPANY W402 (Wavekind Park), and W402 SAMPLING SITE Dave Jacobson TEAM LEADER		SAMPLE SAFE™ CONDITIONS <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:50%; vertical-align: top;"> PACKED BY Dave Jacobson SEAL INTACT UPON RECEIPT BY SAMPLING COMPANY Dave Jacobson SEALED FOR SHIPPING BY Dave Jacobson SEAL NUMBER SEAL INTACT UPON RECEIPT BY LAB. <input type="checkbox"/> Yes <input type="checkbox"/> No </td> <td style="width:50%; vertical-align: top;"> SEAL NUMBER ENSECO seal, no # CONDITION OF CONTENTS INITIAL CONTENTS TEMP. °C SAMPLING STATUS <input type="checkbox"/> Done <input type="checkbox"/> Continuing Until CONTENTS TEMPERATURE UPON RECEIPT BY LAB. °C </td> </tr> </table>		PACKED BY Dave Jacobson SEAL INTACT UPON RECEIPT BY SAMPLING COMPANY Dave Jacobson SEALED FOR SHIPPING BY Dave Jacobson SEAL NUMBER SEAL INTACT UPON RECEIPT BY LAB. <input type="checkbox"/> Yes <input type="checkbox"/> No	SEAL NUMBER ENSECO seal, no # CONDITION OF CONTENTS INITIAL CONTENTS TEMP. °C SAMPLING STATUS <input type="checkbox"/> Done <input type="checkbox"/> Continuing Until CONTENTS TEMPERATURE UPON RECEIPT BY LAB. °C
PACKED BY Dave Jacobson SEAL INTACT UPON RECEIPT BY SAMPLING COMPANY Dave Jacobson SEALED FOR SHIPPING BY Dave Jacobson SEAL NUMBER SEAL INTACT UPON RECEIPT BY LAB. <input type="checkbox"/> Yes <input type="checkbox"/> No	SEAL NUMBER ENSECO seal, no # CONDITION OF CONTENTS INITIAL CONTENTS TEMP. °C SAMPLING STATUS <input type="checkbox"/> Done <input type="checkbox"/> Continuing Until CONTENTS TEMPERATURE UPON RECEIPT BY LAB. °C				

DATE	TIME	SAMPLE ID/DESCRIPTION	SAMPLE TYPE	# CONTAINERS	ANALYSIS PARAMETERS	REMARKS
6-2-92	1610	STP-W24-060292 8			ppt PAH	ppt 5
6-2-92	1248	PCT-W02*-060292 9			ppt PAH	ppt 5
6-2-92	1248	PCT-W402*-060292-A 10			ppt PAH	ppt 75 B.C.
		* note that the sample label on bottle was changed from W420 to W402				
		A ppt-5 for this well sent in other cooler				

CUSTODY TRANSFERS PRIOR TO SHIPPING				SHIPPING DETAILS			
RELINQUISHED BY (SIGNED) David W. Groffert to FedEx	RECEIVED BY (SIGNED) 	DATE 6-2-92	TIME 1730	DELIVERED TO SHIPPER BY 		METHOD OF SHIPMENT FED EX AIRBILL NUMBER 2103420351	
				RECEIVED FOR LAB RMAC	SIGNED B. Musil	DATE/TIME 830 6-3-92	
				ENSECO PROJECT NUMBER 23144			

RMAL CLIENT ID CJSMN01		CLIENT P.O. NUMBER		INVOICE NUMBER	
SHIP TO Auto Station		PICK-UP ON (DATE)	TIME	<input type="checkbox"/> AM <input type="checkbox"/> PM	DELIVERED BY (DATE) June
SHIP BY BRD		(5/29/92)			
UPS CHARGES		FED EX CHARGES	CLIENT FED EX ACCOUNT NUMBER		
COOLERS BILLED TO (SPECIFY CLIENT ID)					

DI _____ GALLONS CARBON FREE _____ GALLONS MILLI-Q _____ GALLONS

NUMBER OF BOTTLES	STANDARD WATER	PARAMETERS	NUMBER OF BOTTLES	BULK WATER	PARAMETERS
1.	32 oz. poly (WM)	Alkalinity, BOD, Chloride, Color, Res. Chlorine, pH, Chromium (VI), Conductance, Fluoride, Nitrite, MBAS, Ortho-Phos., Solids, Sulfate, Sulfite, Turbidity		20. 1/2 gallon glass	Bulk water analysis
2.	16 oz. glass (BR) 50% H2SO4	Ammonia, COD, Nitrate, TKN, TON, Nitrate & Nitrite, Total Phos., TOC, Phenolics		21. 1 gallon glass	
3.	32 oz. glass (BR) 50% H2SO4	TPH, Oil & Grease		SOLIDS	
4.	16 oz. poly (WM) 20% HNO3	Metals, Hardness		30. 16 oz. glass (WM)	Organics, TPH, Metals, RAD, Oil & Grease
5.	2-32 oz. poly (BR) 20% HNO3	Gross Alpha, Gross Beta, Uranium, Radium 226, Radium 228		31. 8 oz. glass (WM)	Wet Chem not listed for *30
6.	8 oz. poly (WM) 50% NaOH	Total and/or Free Cyanide		32. 4 oz. glass (WM)	VOA
7.	8 oz. poly (WM) Zn Ac & NaOH	Sulfide		TCLP	
8.	4.5 oz. poly sterilize	Fecal or Total Coliform (use 2 bottles if both required)		33. 32 oz. glass (WM) 4 oz. glass (WM)	All other analytes VOA
10.	3-40 ml glass w/septa, Na2S2O3	THM		OTHER	
10A.	Trip Blank		32		As per Label
11.	3-40 ml glass w/septa, HCL w/out HCL	VOA, Purgeable Organics	2		15 liters
11A.	Trip Blank				
12.	2-32 oz. glass (BR)	Base Neutral/Acid Compounds	BLUE ICE REQUIRED <input type="checkbox"/> YES <input type="checkbox"/> NO		
13.	2-32 oz. glass (BR)	Pesticides, PCBs	SPECIAL REQUIREMENTS		
14.	32 oz. glass (BR)	Herbicides			
15.	Single: 8 oz. amber glass (BR) Quad: 32 oz. amber glass (BR) 50% H2SO4	TOX-Single: -Quad:	# 3279 (65), # 2242 (65)		
	30		SAMPLE SAFE/COOLER NUMBERS # 3279 (36), # 2004 (36), # 3058 (36), 3705 (36), # 3479 (36), # 3529 (36)		

REQUEST BY		DATE	TIME	<input type="checkbox"/> AM <input type="checkbox"/> PM
RELINQUISHED BY SIGNATURE Robert M. Pink		RECEIVED BY SIGNATURE Michael J. K...	DATE 6-2-92	TIME 1815 hrs
		6 1XL AMBER BROKEN NOT Packed Tightly		

1X
ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

23144-06

Name: ENSECO

Contract:

IGV-W105-060292

Lab Code: ENSECO

Case No.: 23144

SAS No.:

SDG No.:

Matrix: (soil/water) WATER

Lab Sample ID: 23144-06

Sample wt/vol: 4200 (g/mL) ML

Lab File ID: C5757

Level: (low/med) LOW

Date Received: 06/03/92

% Moisture: decanted: (Y/N) N

Date Extracted: 06/04/92

Concentrated Extract Volume: 500(uL)

Date Analyzed: 07/09/92

Injection Volume: 2.0(uL)

Dilution Factor: 0.476

GPC Cleanup: (Y/N) N pH: 7.0

CONCENTRATION UNITS:
(ng/L or ug/Kg) ng/L

CAS NO.

COMPOUND

Q

271-89-6-----	2,3-Dibenzofuran	20	U
496-11-7-----	2,3-Dihydroindene	250	
95-13-6-----	1H-Indene	56	
91-20-3-----	Naphthalene	460	B
4565-32-6-----	Benzo(B)Thiophene	61	
91-22-5-----	Quinoline	6	R
120-72-9-----	1H-Indole	280	
91-57-6-----	2-Methylnaphthalene	100	B
90-12-0-----	1-Methylnaphthalene	210	
92-52-4-----	Biphenyl	98	
208-96-8-----	Acenaphthylene	100	
83-32-9-----	Acenaphthene	330	
132-64-9-----	Dibenzofuran	160	
86-73-7-----	Fluorene	280	
132-65-0-----	Dibenzothiophene	28	
85-01-8-----	Phenanthrene	430	B
120-12-7-----	Anthracene	130	
260-94-6-----	Acridine	67	
86-74-8-----	Carbazole	160	
206-44-0-----	Fluoranthene	380	
129-00-0-----	Pyrene	270	
56-55-3-----	Benzo(A)Anthracene	25	R
218-01-9-----	Chrysene	15	
205-99-2-----	Benzo(B)Fluoranthene	5	JR
207-08-9-----	Benzo(K)Fluoranthene	9	U
192-97-2-----	Benzo(E)Pyrene	7	U
50-32-8-----	Benzo(A)Pyrene	9	U
198-55-0-----	Perylene	10	U
193-39-5-----	Indeno(1,2,3-CD)Pyrene	8	U
53-70-3-----	Dibenz(A,H)Anthracene	6	U
191-24-2-----	Benzo(G,H,I)Perylene	10	U

1X
ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

23144-07

Name: ENSECO

Contract:

IGV-W105-060292

Lab Code: ENSECO

Case No.: 23144

SAS No.:

SDG No.:

Matrix: (soil/water) WATER

Lab Sample ID: 23144-07

Sample wt/vol: 4200 (g/mL) ML

Lab File ID: C5835

Level: (low/med) LOW

Date Received: 06/03/92

% Moisture: decanted: (Y/N) N

Date Extracted: 06/08/92

Concentrated Extract Volume: 500(uL)

Date Analyzed: 07/17/92

Injection Volume: 2.0(uL)

Dilution Factor: 1.19

GPC Cleanup: (Y/N) N pH: 7.0

CONCENTRATION UNITS:
(ng/L or ug/Kg) ng/L

CAS NO.

COMPOUND

Q

271-89-6-----	2,3-Dibenzofuran	49	U
496-11-7-----	2,3-Dihydroindene	250	
95-13-6-----	1H-Indene	55	
91-20-3-----	Naphthalene	550	B
4565-32-6-----	Benzo(B)Thiophene	58	
91-22-5-----	Quinoline	13	U
120-72-9-----	1H-Indole	210	
91-57-6-----	2-Methylnaphthalene	140	B
90-12-0-----	1-Methylnaphthalene	250	B
92-52-4-----	Biphenyl	110	
208-96-8-----	Acenaphthylene	110	
83-32-9-----	Acenaphthene	330	
132-64-9-----	Dibenzofuran	180	
86-73-7-----	Fluorene	300	
132-65-0-----	Dibenzothiophene	40	
85-01-8-----	Phenanthrene	720	B
120-12-7-----	Anthracene	200	
260-94-6-----	Acridine	81	
86-74-8-----	Carbazole	140	
206-44-0-----	Fluoranthene	710	
129-00-0-----	Pyrene	560	B
56-55-3-----	Benzo(A)Anthracene	120	
218-01-9-----	Chrysene	69	
205-99-2-----	Benzo(B)Fluoranthene	56	R
207-08-9-----	Benzo(K)Fluoranthene	26	
192-97-2-----	Benzo(E)Pyrene	37	
50-32-8-----	Benzo(A)Pyrene	71	
198-55-0-----	Perylene	24	U
193-39-5-----	Indeno(1,2,3-CD)Pyrene	18	J
53-70-3-----	Dibenz(A,H)Anthracene	15	U
191-24-2-----	Benzo(G,H,I)Perylene	21	J

RAP SECTION 6.1.4. MONITORING

4TH QUARTER - 1992

PAH MONITORING



CASE NARRATIVE

FOR

City of St. Louis Park

December 21, 1992

Enseco - RMAL Project Number 026220

Introduction

Ten aqueous samples (includes QC) were received at Enseco Rocky Mountain Analytical Laboratory on November 11, 1992. The samples were logged in under RMAL project number 026220. Sample PCJ-SLP15FBD-111092 was extracted and held per the April 1990 QAPP. A cross reference associating the RMAL sample numbers to the actual field sample numbers is included. The samples were analyzed for low level part-per-trillion (ppt) polynuclear aromatic hydrocarbons (PAH).

Data Quality Assessment

The results contained in this report were reviewed relative to data acceptance criteria as specified in the April, 1990 QAPP for completeness, precision, accuracy, representativeness and defensibility of the data. Unless otherwise stated below, no quality control problems or technical difficulties were encountered which would impact the interpretation or use of data in this report.

PPT PAH

Sample 026220-006 showed a surrogate which was outside of control limits. All instrument calibration, surrogate standard concentration, etc. were checked and found to be in control. It has been concluded that an interference specific to the surrogate is present which resulted in out of control recoveries.

Case Narrative - RMAL #026220
December 21, 1992
Page Two

Samples 026220-001, -0001DU, -0003, -0005, and 026220-0007, showed target compounds above the upper calibration range. These samples were reanalyzed at dilutions. Both the original and reanalysis data are reported for these samples. Surrogates could not be measured in samples 026220-0001DL, -0001DUDL, -0003,, -0003DL1, -0003DL2, -0005, -0005DL, and -0007 due to the level of dilutions performed.

The 4800 ng/ml and the 2400 ng/ml standards had excessive saturation, therefore they were not used as the upper range for the 5-point calibration curve. Instead, the calibration curve used was, 20 ng/ml, 40 ng/ml, 240 ng/ml, 600 ng/ml, and 1200 ng/ml.

All samples associated with project 026220 show target compounds that do not meet secondary ion confirmation. In some instances a compound that does not meet secondary ion confirmation criteria may still be determined to be present in the sample after close inspection of the data by the analyst. Supportive data includes mass chromatograms maxima at the same scan for primary and secondary ions, as well as discernible quantitation interference with the secondary ion. These compounds are flagged with the letter (R) on the data sheets (Form I) as per the 1990 QAPP.

This data package is in compliance with the terms and conditions of the 1990 QAPP, both technically and for completeness, for other than the conditions detailed above.

Reported by: Julieann L. Kramer
Julieann L. Kramer
Program Manager

Date: Dec 22, 1992

Approved by: Mark Dymerski
Mark Dymerski
Technical Manager

Date: 12-22-92

ANALYTICAL TEST REQUESTS
for
City of St. Louis Park

Lab ID: 026220	Group Code	Analysis Description	Custom Test?
0001 , 0001, 0002 , 0004, 0006	A	Polynuclear Aromatic Hydrocarbons, SIM Low Level Prep - PAH/SIM by GC/MS Low Level	N N
0001	B	Polynuclear Aromatic Hydrocarbons, SIM Low Level Prep - PAH/SIM by GC/MS Low Level	N N
0003 , 0005, 0007	C	Polynuclear Aromatic Hydrocarbons, SIM Low Level Prep - PAH/SIM by GC/MS Low Level	N N



Qualifier Codes and Their Usage

- U** = Indicates compound was analyzed for but not detected. The sample quantitation limit must be corrected for dilution and for percent moisture. For example, 10 U for phenol in water if the sample final volume is the protocol-specified final volume. If a 1 to 10 dilution of extract is necessary, the reported limit is 100 U. For a soil sample, the value must also be adjusted for percent moisture.
- J** = Indicates an estimated value. This flag is used either when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed, or when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the sample quantitation limit but greater than zero. For example, if the sample quantitation limit is 10 ug/L, but a concentration of 3 ug/L is calculated, report it as 3J. The sample quantitation limit must be adjusted for dilution as discussed for the U flag.
- N** = Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds, where the identification is based on a mass spectral library search. It is applied to all TIC results.
- P** = This flag is used for a pesticide/Aroclor target analyte when there is greater than 25% difference for detected concentrations between the two GC columns (see Form X). The lower of the two values is reported on Form I and flagged with a "p".
- C** = This flag applies to pesticide results where the identification has been confirmed by GC/MS. If GC/MS confirmation was attempted but was unsuccessful, do not apply this flag, instead use a laboratory-defined flag, discussed below.
- B** = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action. This flag must be used for a TIC as well as for a positively identified target compound.



Qualifer Codes and Their Usage

Page Two

- E = This flag identifies compounds whose concentrations exceed the calibration range of the GC/MS instrument for that specific analysis. If one or more compounds have a response greater than full scale, except as noted in Exhibit D, the sample or extract must be diluted and re-analyzed accordingly to the specifications in Exhibit D. All such compounds with a response greater than full scale should have the concentration flagged with an "E" on the Form I for the original analysis. If the dilution of the extract causes any compounds identified in the first analysis to be below the calibration range in the second analysis, then the results of both analyses shall be reported on separate copies of Form I. The Form I for the diluted sample shall have the "DL" suffix appended to the sample number. NOTE: For total xylenes, where three isomers are quantified as two peaks, the calibration range of each peak should be considered separately, e.g., a diluted analysis is not required for total xylenes unless the concentration of either peak separately exceeds 200 ug/L.
- D = This flag identifies all compounds identified in an analysis at a secondary dilution factor. If a sample or extract is re-analyzed at a higher dilution factor, as in the "E" flag above, the "DL" suffix is appended to the sample number on the Form I for the diluted sample, and all concentration values reported on that Form I are flagged with the "D" flag. This flag alerts data users that any discrepancies between the concentrations reported may be due to dilution of the sample or extract.
- A = This flag indicates that a TIC is a suspected aldol-condensation product.
- X = Other specific flags may be required to properly define the results. If used, they must be fully described, and such description attached to the Sample Data Summary Package and the SDG Narrative. Begin by using "X". If more than one flag is required, use "Y" and "Z" as needed. If more than five qualifiers are required for a sample result, use the "X" flag to combine several flags, as needed. For instance, the "X" flag might combine the "A", "B", and "D" flags for some sample. The laboratory-defined flags are limited to the letters "X", "Y", and "Z".
- R = This flag is used for polyaromatic hydrocarbons which show target compounds that do not meet secondary ion confirmation. In some instances a compound that does not meet secondary ion confirmation criteria may still be determined to be present in the sample after close inspection of the data by the analyst. Supportive data includes mass chromatograms maxima at the same scan for primary and secondary ions, as well as discernible quantitation interference with the secondary ion.

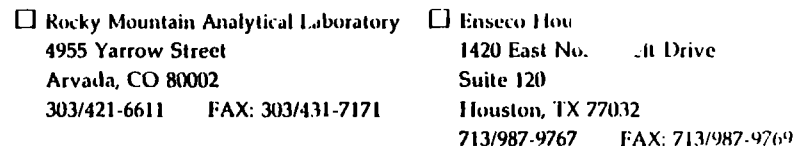
SAMPLE DESCRIPTION INFORMATION
for
City of St. Louis Park

Lab ID	Client ID	Matrix	Sampled Date	Time	Received Date
026220-0001-SA	PCJ-SLP15-111092	AQUEOUS	10 NOV 92		11 NOV 92
026220-0001-DU	PCJ-SLP15D-111092	AQUEOUS	10 NOV 92		11 NOV 92
026220-0001-FB	PCJ-SLP15FB-111092	AQUEOUS	10 NOV 92		11 NOV 92
026220-0001-FD	PCJ-SLP15FBD-111092	AQUEOUS	10 NOV 92		11 NOV 92
026220-0002-SA	PCJ-SLP8-111092	AQUEOUS	10 NOV 92		11 NOV 92
026220-0003-SA	IEV-W105-111092	AQUEOUS	10 NOV 92		11 NOV 92
026220-0004-SA	PCJ-SLP6-111092	AQUEOUS	10 NOV 92		11 NOV 92
026220-0005-SA	STP-W24-111092	AQUEOUS	10 NOV 92	10:30	11 NOV 92
026220-0006-SA	STP-W122-111092	AQUEOUS	10 NOV 92	12:00	11 NOV 92
026220-0007-SA	STP-W412-111092	AQUEOUS	10 NOV 92	13:35	11 NOV 92

TABLE OF CONTENTS
FOR
CITY OF ST. LOUIS PARK
RMAL PROJECT# 026220

PPT-PAH

QC Summary.....	0001
Sample Data.....	0016
Standards Data.....	0721
Raw QC Data.....	1420



CHAIN OF CUSTODY		SAMPLE SAFE™ CONDITIONS	
ENSECO CLIENT		PACKED BY	SEAL NUMBER
PROJECT	City of ST LOUIS PARK (WATER DEPT)	SEAL INTACT UPON RECEIPT BY SAMPLING COMPANY	CONDITION OF CONTENTS
SAMPLING COMPANY		SEALED FOR SHIPPING BY	INITIAL CONTENTS TEMP
SAMPLING SITE	SAITE	SEAL NUMBER	°C
TEAM LEADER	SPICE	SAMPLING STATUS	
	7/2/18	<input type="checkbox"/> Done <input type="checkbox"/> Continuing Until	
		SEAL INTACT UPON RECEIPT BY LAB	CONTENTS TEMPERATURE UPON RECEIPT BY LAB
		<input type="checkbox"/> Yes <input type="checkbox"/> No	(#3791) 7.0 °C

[illegible]

CUSTODY TRANSFERS PRIOR TO SHIPPING				SHIPPING DETAILS	
RELINQUISHED BY (SIGNED)	RECEIVED BY (SIGNED)	DATE	TIME	DELIVERED TO SHIPPER BY M. J. S.	
				METHOD OF SHIPMENT FED EX	AIRBILL NUMBER 2103420524
				RECEIVED FOR LAB ENSECO RMR	SIGNED Robert M. Reiff
				ENSECO PROJECT NUMBER 26220	DATE/TIME 11 NOV 92 0834 hrs



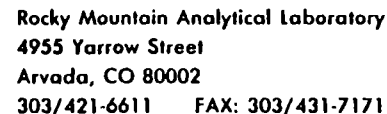
Rocky Mountain Analytical Laboratory
4955 Yarrow Street
Arvada, CO 80002
303/421-6611 FAX: 303/431-7171

CHAIN OF CUSTODY

ENSECO CLIENT <i>CITY of ST LOUIS PARK (WATER DEPT)</i>		SAMPLE SAFE™ CONDITIONS PACKED BY <i>MZK</i>	
PROJECT <i>SLP</i>		SEAL INTACT UPON RECEIPT BY SAMPLING COMPANY <i>By</i>	
SAMPLING COMPANY <i>SLP</i>		SEALED FOR SHIPPING BY <i>MZK</i>	
SAMPLING SITE <i>SLP</i>		INITIAL CONTENTS TEMP. °C 	
TEAM LEADER <i>MZK</i>		SEAL INTACT UPON RECEIPT BY LAB. <input type="checkbox"/> Yes <input type="checkbox"/> No	
		CONTENTS TEMPERATURE UPON RECEIPT BY LAB <i>(#3784) 11.5 °C</i>	

DATE	TIME	SAMPLE ID/DESCRIPTION	SAMPLE TYPE	# CONTAINERS	ANALYSIS PARAMETERS	REMARKS
11-10-92		PCJ-SLP15FB-111092 -01FB	IXL AMBER	6	PPT PAH	PPT 5
11-10-92		PCJ-SLP15FBD-111092 -01FBD	IXL AMBER	6	PPT PAH	PPT 3
11-10-92		PCJ-SLP-8-111092 -02SA	IXL AMBER	6	PPT PAH	PPT 5

CUSTODY TRANSFERS PRIOR TO SHIPPING				SHIPPING DETAILS	
RELINQUISHED BY (SIGNED)	RECEIVED BY (SIGNED)	DATE	TIME	DELIVERED TO SHIPPER BY <i>MZK</i>	
				METHOD OF SHIPMENT <i>FED EX</i>	
				AIRBILL NUMBER <i>2103480524</i>	
				RECEIVED FOR LAB <i>ENSECO-RMA</i>	SIGNED <i>Robert M. Pich</i>
				DATE/TIME <i>11 NOV 92</i>	
				ENSECO PROJECT NUMBER <i>26220</i>	



ENSECO CLIENT

CITY OF ST LOUIS PARK (WATER DEPT)

SAMPLING COMPANY

SAMPLING SITE

TEAM LEADER

PACKED BY

21.7.2

SEAL INTACT UPON RECEIPT BY SAMPLING COMPANY

SEALED FOR SHIPPING BY

SEAL NUMBER

SAMPLING STATUS	
1	2
3	4
5	6
7	8
9	10
11	12
13	14
15	16
17	18
19	20
21	22
23	24
25	26
27	28
29	30
31	32
33	34
35	36
37	38
39	40
41	42
43	44
45	46
47	48
49	50
51	52
53	54
55	56
57	58
59	60
61	62
63	64
65	66
67	68
69	70
71	72
73	74
75	76
77	78
79	80
81	82
83	84
85	86
87	88
89	90
91	92
93	94
95	96
97	98
99	100

☐ Done

☐ Continuing Until

SEAL INTACT UPON RECEIPT BY LAB

☐ Yes☐ No

CONTENTS TEMPERATURE UPON RECEIPT BY LAB

(#3789) 12.3 °C

CUSTODY TRANSFERS PRIOR TO SHIPPING

SHIPPING DETAILS

RELINQUISHED BY (SIGNED)

RECEIVED BY (SIGNED)

DATE _____

TIME

DELIVERED TO SHIPPER BY

7328

METHOD OF SHIPMENT

FED EX

RECEIVED FOR LAB

ENSECO-RMAL

ENSECO PROJECT NUMBER

26220

SIGNED

Robert M. Ritz

AIRBILL NUMBER	
-----------------------	--

2103420524

[illegible]

11 Nov 92



☐ Rocky Mountain Analytical Laboratory ☐ Enseco Hou.
4955 Yarrow Street 1420 East North Belt Drive
Arvada, CO 80002 Suite 120
303/421-6611 FAX: 303/431-7171 Houston, TX 77032
713/987-9767 FAX: 713/987-9769

CHAIN OF CUSTODY

ENSECO CLIENT <i>St. Louis Park</i>		SAMPLE SAFE™ CONDITIONS	
PROJECT <i>St. Louis Park 1520-007-</i>		PACKED BY <i>Tom Johnson</i>	SEAL NUMBER
SAMPLING COMPANY <i>ENSR Consulting & Engineering</i>		SEAL INTACT UPON RECEIPT BY SAMPLING COMPANY	CONDITION OF CONTENTS <i>Packed in Ice</i>
SAMPLING SITE <i>St. Louis Park, Mn</i>		SEALED FOR SHIPPING BY <i>Tom Johnson</i>	INITIAL CONTENTS TEMP <i>40</i> °C
TEAM LEADER <i>Peter Moore</i>		SEAL NUMBER	SAMPLING STATUS <input type="checkbox"/> Done <input type="checkbox"/> Continuing Until
		SEAL INTACT UPON RECEIPT BY LAB <input type="checkbox"/> Yes <input type="checkbox"/> No	CONTENTS TEMPERATURE UPON RECEIPT BY LAB <i>(#3191)</i> <i>6.4</i> °C

DATE	TIME	SAMPLE ID/DESCRIPTION	SAMPLE TYPE	# CONTAINERS	ANALYSIS PARAMETERS	REMARKS
11-10-92	10:30	STP-W24-1110-92 -05 SA	H ₂ O	6	PPT-PAH PPT 75	
11-10-92	12:00	STP-W122-1110-92 -06 SA	H ₂ O	6	PPT-PAH PPT 5	
11-10-92	13:35	STP-W412-1110-92 -07 SA	H ₂ O	6	PPT-PAH PPT 75	

CUSTODY TRANSFERS PRIOR TO SHIPPING				SHIPPING DETAILS	
RELINQUISHED BY (SIGNED)	RECEIVED BY (SIGNED)	DATE	TIME	DELIVERED TO SHIPPER BY	
<i>Tom C. Johnson</i>		11-10-92	14:46	<i>Tom Johnson</i>	
				METHOD OF SHIPMENT	AIRBILL NUMBER
				<i>Fed Ex</i>	<i>2103420524</i>
				RECEIVED FOR LAB	SIGNED
				<i>ENSECO-RURAL</i>	<i>Robert M. Ratz</i>
				ENSECO PROJECT NUMBER	DATE/TIME
				<i>26220</i>	<i>11 NOV 92 0836h</i>

1X
ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

Name: ENSECO

Contract:

26220-03

Lab Code: ENSECO

Case No.: 26220

SAS No.:

IEV-W105-111092

SDG No.:

Matrix: (soil/water) WATER

Lab Sample ID: 26220-03

Sample wt/vol: 4200 (g/mL) ML

Lab File ID: C6912

Level: (low/med) LOW

Date Received: 11/11/92

% Moisture: decanted: (Y/N) N

Date Extracted: 11/13/92

Concentrated Extract Volume: 500(uL)

Date Analyzed: 12/04/92

Injection Volume: 2.0(uL)

Dilution Factor: 1.19

GPC Cleanup: (Y/N) N pH: 7.0

CONCENTRATION UNITS:
(ng/L or ug/Kg) ng/L

Q

CAS NO.	COMPOUND		
271-89-6-----	2,3-Dibenzofuran	53	
496-11-7-----	2,3-Dihydroindene	750	B
95-13-6-----	1H-Indene	320	
91-20-3-----	Naphthalene	1600	BERT
4565-32-6-----	Benzo(B)Thiophene	360	
91-22-5-----	Quinoline	13	U
120-72-9-----	1H-Indole	2900	ERT
91-57-6-----	2-Methylnaphthalene	420	B
90-12-0-----	1-Methylnaphthalene	400	
92-52-4-----	Biphenyl	140	
208-96-8-----	Acenaphthylene	130	
83-32-9-----	Acenaphthene	420	
132-64-9-----	Dibenzofuran	200	
86-73-7-----	Fluorene	230	
132-65-0-----	Dibenzothiophene	22	R
85-01-8-----	Phenanthrene	290	B
120-12-7-----	Anthracene	66	
260-94-6-----	Acridine	220	
86-74-8-----	Carbazole	160	
206-44-0-----	Fluoranthene	150	B
129-00-0-----	Pyrene	130	B
56-55-3-----	Benzo(A)Anthracene	11	J
218-01-9-----	Chrysene	10	J
205-99-2-----	Benzo(B)Fluoranthene	24	U
207-08-9-----	Benzo(K)Fluoranthene	21	U
192-97-2-----	Benzo(E)Pyrene	18	U
50-32-8-----	Benzo(A)Pyrene	21	U
198-55-0-----	Perylene	24	U
193-39-5-----	Indeno(1,2,3-CD)Pyrene	20	U
53-70-3-----	Dibenz(A,H)Anthracene	15	U
191-24-2-----	Benzo(G,H,I)Perylene	26	U

1X
ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

26220-03DL1

Name: ENSECO

Contract:

IEV-W105-111092

Lab Code: ENSECO

Case No.: 26220

SAS No.:

SDG No.:

Matrix: (soil/water) WATER

Lab Sample ID: 26220-03DL1

Sample wt/vol: 4200 (g/mL) ML

Lab File ID: C6921

Level: (low/med) LOW

Date Received: 11/11/92

% Moisture: decanted: (Y/N) N

Date Extracted: 11/13/92

Concentrated Extract Volume: 500(uL)

Date Analyzed: 12/05/92

Injection Volume: 2.0(uL)

Dilution Factor: 11.9

GPC Cleanup: (Y/N) N pH: 7.0

CONCENTRATION UNITS:
(ng/L or ug/Kg) ng/L

CAS NO.

COMPOUND

Q

271-89-6-----	2,3-Dibenzofuran	490	U
496-11-7-----	2,3-Dihydroindene	690	BD
95-13-6-----	1H-Indene	280	D
91-20-3-----	Naphthalene	3700	BD
4565-32-6-----	Benzo(B)Thiophene	350	D
91-22-5-----	Quinoline	130	U
120-72-9-----	1H-Indole	23000	DET
91-57-6-----	2-Methylnaphthalene	390	BD
90-12-0-----	1-Methylnaphthalene	390	D
92-52-4-----	Biphenyl	130	DJ
208-96-8-----	Acenaphthylene	120	DJ
83-32-9-----	Acenaphthene	420	D
132-64-9-----	Dibenzofuran	180	D
86-73-7-----	Fluorene	210	D
132-65-0-----	Dibenzothiophene	100	U
85-01-8-----	Phenanthrene	290	BD
120-12-7-----	Anthracene	100	U
260-94-6-----	Acridine	200	DJ
86-74-8-----	Carbazole	140	DJ
206-44-0-----	Fluoranthene	130	BDJ
129-00-0-----	Pyrene	110	BDJ
56-55-3-----	Benzo(A)Anthracene	240	U
218-01-9-----	Chrysene	260	U
205-99-2-----	Benzo(B)Fluoranthene	240	U
207-08-9-----	Benzo(K)Fluoranthene	210	U
192-97-2-----	Benzo(E)Pyrene	180	U
50-32-8-----	Benzo(A)Pyrene	210	U
198-55-0-----	Perylene	240	U
193-39-5-----	Indeno(1,2,3-CD)Pyrene	200	U
53-70-3-----	Dibenz(A,H)Anthracene	150	U
191-24-2-----	Benzo(G,H,I)Perylene	260	U

1X
ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

26220-03DL2

Name: ENSECO

Contract:

IEV-W105-111092

Lab Code: ENSECO

Case No.: 26220

SAS No.:

SDG No.:

Matrix: (soil/water) WATER

Lab Sample ID: 26220-03DL2

Sample wt/vol: 4200 (g/mL) ML

Lab File ID: C6961

Level: * (low/med) LOW

Date Received: 11/11/92

% Moisture: decanted: (Y/N) N

Date Extracted: 11/13/92

Concentrated Extract Volume: 500(uL)

Date Analyzed: 12/10/92

Injection Volume: 2.0(uL)

Dilution Factor: 119.0

GPC Cleanup: (Y/N) N pH: 7.0

CONCENTRATION UNITS:
(ng/L or ug/Kg) ng/L

CAS NO.

COMPOUND

Q

271-89-6-----	2,3-Dibenzofuran	4900	U
496-11-7-----	2,3-Dihydroindene	1300	U
95-13-6-----	1H-Indene	860	U
91-20-3-----	Naphthalene	3900	BDJ
4565-32-6-----	Benzo(B)Thiophene	860	U
91-22-5-----	Quinoline	1300	U
120-72-9-----	1H-Indole	27000	D
91-57-6-----	2-Methylnaphthalene	860	U
90-12-0-----	1-Methylnaphthalene	1500	U
92-52-4-----	Biphenyl	4000	U
208-96-8-----	Acenaphthylene	1300	U
83-32-9-----	Acenaphthene	1200	U
132-64-9-----	Dibenzofuran	950	U
86-73-7-----	Fluorene	950	U
132-65-0-----	Dibenzothiophene	1000	U
85-01-8-----	Phenanthrene	1200	U
120-12-7-----	Anthracene	1000	U
260-94-6-----	Acridine	2700	U
86-74-8-----	Carbazole	1800	U
206-44-0-----	Fluoranthene	1300	U
129-00-0-----	Pyrene	1300	U
56-55-3-----	Benzo(A)Anthracene	2400	U
218-01-9-----	Chrysene	2600	U
205-99-2-----	Benzo(B)Fluoranthene	2400	U
207-08-9-----	Benzo(K)Fluoranthene	2100	U
192-97-2-----	Benzo(E)Pyrene	1800	U
50-32-8-----	Benzo(A)Pyrene	2100	U
198-55-0-----	Perylene	2400	U
193-39-5-----	Indeno(1,2,3-CD)Pyrene	2000	U
53-70-3-----	Dibenz(A,H)Anthracene	1500	U
191-24-2-----	Benzo(G,H,I)Perylene	2600	U

PHENOLICS MONITORING



January 13, 1993

Mr. James Grube
City of St. Louis Park
5005 Minnetonka Blvd.
St. Louis Park, MN 55416

Dear Mr Grube:

Enclosed is the ppb phenol report for eleven aqueous samples, including matrix QC, received at Enseco-Rocky Mountain Analytical laboratory on December 01, 1992.

Please call if you have any questions.

Sincerely,

Kathryn K. Okonzak
Program Manager

Reviewed by:

Julie Kramer
Program Manager

KKO/JLK
Enclosures

RMAL #026522

COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

Lab Name: ROCKY MOUNTAIN ANALYTICAL Contract: City of St. Louis Park

Lab Code: ENSECO Case No.: 26522 SAS No.: N/A SDG No.: N/A

SOW No.: 3/90

EPA Sample No.	Lab Sample ID.
PCJ-SLP4TP-120192	26522-01
STP-W410TP-120192	26522-02
DPV-W420TP-120192	26522-03
DPV-W421TP-120192	26522-04
DPV-W422TP-120192	26522-05
DPV-W422TPD-120192	26522-05DU
DPV-W422TPFB-120192	26522-05FB
DPV-W422TPFBD-120192	26522-05FBD
DPV-W422TPMS-120192	26522-05MS
IGV-W105PT-120192	26522-06

Parameters	Method No.	Detection Limits	Source
PHENOL	420.1	5 ug/L	1

Comments:

SIX WATER SAMPLES FOR PHENOL ANALYSIS.
RMAL QC#026522

Sources:

1="Methods for the Chemical Analysis of Water and Wastes", USEPA-EMSL, Cincinnati.

Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: Kathryn Okonzak
Date: 1/15/93

Name: Kathryn Okonzak
Title: Program Manager

RESULT QUALIFIERS

C - Concentration Qualifier:

Enter a "B" if the reported value is less than the Contract Required Detection Limit (CRDL) but greater than the Instrument Detection Limit (IDL). If the analyte was analyzed for but not detected, a "U" must be entered.

Q - Quality Control Qualifiers:

- E - The reported value is estimated because of the presence of interference. An explanatory note must be included under Comments on the cover Page (if the problem applies to all samples) or on the specific FORM I-IN (if it is an isolated problem).
- M - Duplicate injection precision not met.
- N - Spiked sample recovery not within control limits.
- S - The reported value was determined by the Method of Standard Additions (MSA).
- W - Post-digestion spike for Furnace AA analysis is out of control limits (85-115%), while sample absorbance is less than 50% of spike absorbance.
- * - Duplicate analysis not within control limits.
- + - Correlation coefficient for the MSA is less than 0.995.

Entering "S", "W", or "+" is mutually exclusive. No combination of these qualifiers can appear in the same field for an analyte.

M - Method Qualifier:

- "P" for ICP
- "A" for Flame AA
- "F" for Furnace AA
- "CV" for Manual Cold Vapor AA
- "AV" for Automated Cold Vapor AA
- "AS" for Semi-Automated Spectrophotometric
- "C" for Manual Spectrophotometric
- "T" for Titrimetric
- "NR" if the analyte is not required to be analyzed

IGV-W105PT-120192

INORGANIC ANALYSIS DATA SHEET

Lab Name: ROCKY MOUNTAIN ANALYTICAL Contract: City of St. Louis Park

Lab Code: ENSECO Case No.: 26522 SAS No.: N/A SDG No.: N/A

Matrix (soil/water): WATER Lab Sample ID: 26522-06

Level (low/med): LOW Date Received: 12/02/92

% Solids: 0.0

Concentration Units: ug/L

Analyte	Concentration	C	Q	M
Phenol	13.7			

Color Before: colorless Clarity Before: clear

Texture:

Color After: Clarity After:

Artifacts:

Comments:

RAP SECTION 6.1.4. MONITORING

CONFIRMATION MONITORING



CASE NARRATIVE

FOR

City of St. Louis Park

February 08, 1993

Enseco - RMAL Project Number 027112

Introduction

Six aqueous samples (includes QC) were received at Enseco Rocky Mountain Analytical Laboratory on January 12, 1993. The samples were logged in under RMAL project number 027112. Sample IGV-W105FBD-011193 was extracted and held per the April 1990 QAPP. A cross reference associating the RMAL sample numbers to the actual field sample numbers is included. The samples were analyzed for low level part-per-trillion (ppt) polynuclear aromatic hydrocarbons (PAH).

Data Quality Assessment

The results contained in this report were reviewed relative to data acceptance criteria as specified in the April, 1990 QAPP for completeness, precision, accuracy, representativeness and defensibility of the data. Unless otherwise stated below, no quality control problems or technical difficulties were encountered which would impact the interpretation or use of data in this report.

PPT PAH

There were some compound recoveries and % RPDs that were outside of the specified matrix spike control limits due to an interference present in the sample. These recoveries are listed on the enclosed Forms 3C. Despite some low recoveries, the MS/MSD requirements, as specified in section 11.1.3 of the QAPP, were met and no further action was taken.

Case Narrative - RMAL #027112
February 08, 1993
Page Two

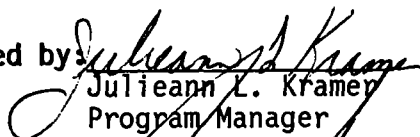
Samples 027112-0001 showed target compounds above the upper calibration range. The sample, and its associated duplicate, matrix spike and matrix spike duplicate, were reanalyzed at a 1:4 dilution. Both the original and reanalysis data are reported.

The 4800 ng/ml and the 2400 ng/ml standards had excessive saturation, therefore they were not used as the upper range for the 5-point calibration curve. Instead, the calibration curve used was, 20 ng/ml, 40 ng/ml, 240 ng/ml, 600 ng/ml, and 1200 ng/ml.

Sample 027112-001 showed target compounds that do not meet secondary ion confirmation. In some instances a compound that does not meet secondary ion confirmation criteria may still be determined to be present in the sample after close inspection of the data by the analyst. Supportive data includes mass chromatograms maxima at the same scan for primary and secondary ions, as well as discernible quantitation interference with the secondary ion. These compounds are flagged with the letter (R) on the data sheets (Form I) as per the 1990 QAPP.

This data package is in compliance with the terms and conditions of the 1990 QAPP, both technically and for completeness, for other than the conditions detailed above.

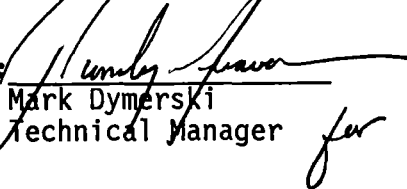
Reported by:


Julieann L. Kramer
Program Manager

Date:

Feb 08, 1993

Approved by:


Mark Dymerski
Technical Manager

Date:

4 / 9 / 93

SAMPLE DESCRIPTION INFORMATION
for
City of St. Louis Park

Lab ID	Client ID	Matrix	Sampled Date Time	Received Date
027112-0001-SA	IGV-W105-011193	AQUEOUS	11 JAN 93	12 JAN 93
027112-0001-DU	IGV-W105D-011193	AQUEOUS	11 JAN 93	12 JAN 93
027112-0001-FB	IGV-W105FB-011193	AQUEOUS	11 JAN 93	12 JAN 93
027112-0001-FD	IGV-W105FBD-011193	AQUEOUS	11 JAN 93	12 JAN 93
027112-0001-MS	IGV-W105MS-011193	AQUEOUS	11 JAN 93	12 JAN 93
027112-0001-SD	IGV-W105MSD-011193	AQUEOUS	11 JAN 93	12 JAN 93

ANALYTICAL TEST REQUESTS
for
City of St. Louis Park

Lab ID: 027112	Group Code	Analysis Description	Custom Test?
0001 , 0001	A	Polynuclear Aromatic Hydrocarbons, SIM Low Level	N
		Prep - PAH/SIM by GC/MS Low Level	N
0001	B	Prep - PAH/SIM by GC/MS Low Level	N



Qualifier Codes and Their Usage

- U** = Indicates compound was analyzed for but not detected. The sample quantitation limit must be corrected for dilution and for percent moisture. For example, 10 U for phenol in water if the sample final volume is the protocol-specified final volume. If a 1 to 10 dilution of extract is necessary, the reported limit is 100 U. For a soil sample, the value must also be adjusted for percent moisture.
- J** = Indicates an estimated value. This flag is used either when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed, or when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the sample quantitation limit but greater than zero. For example, if the sample quantitation limit is 10 ug/L, but a concentration of 3 ug/L is calculated, report it as 3J. The sample quantitation limit must be adjusted for dilution as discussed for the U flag.
- N** = Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds, where the identification is based on a mass spectral library search. It is applied to all TIC results.
- P** = This flag is used for a pesticide/Aroclor target analyte when there is greater than 25% difference for detected concentrations between the two GC columns (see Form X). The lower of the two values is reported on Form I and flagged with a "P".
- C** = This flag applies to pesticide results where the identification has been confirmed by GC/MS. If GC/MS confirmation was attempted but was unsuccessful, do not apply this flag, instead use a laboratory-defined flag, discussed below.
- B** = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action. This flag must be used for a TIC as well as for a positively identified target compound.



Qualifer Codes and Their Usage
Page Two

- E = This flag identifies compounds whose concentrations exceed the calibration range of the GC/MS instrument for that specific analysis. If one or more compounds have a response greater than full scale, except as noted in Exhibit D, the sample or extract must be diluted and re-analyzed accordingly to the specifications in Exhibit D. All such compounds with a response greater than full scale should have the concentration flagged with an "E" on the Form I for the original analysis. If the dilution of the extract causes any compounds identified in the first analysis to be below the calibration range in the second analysis, then the results of both analyses shall be reported on separate copies of Form I. The Form I for the diluted sample shall have the "DL" suffix appended to the sample number. NOTE: For total xylenes, where three isomers are quantified as two peaks, the calibration range of each peak should be considered separately, e.g., a diluted analysis is not required for total xylenes unless the concentration of either peak separately exceeds 200 ug/L.
- D = This flag identifies all compounds identified in an analysis at a secondary dilution factor. If a sample or extract is re-analyzed at a higher dilution factor, as in the "E" flag above, the "DL" suffix is appended to the sample number on the Form I for the diluted sample, and all concentration values reported on that Form I are flagged with the "D" flag. This flag alerts data users that any discrepancies between the concentrations reported may be due to dilution of the sample or extract.
- A = This flag indicates that a TIC is a suspected aldol-condensation product.
- X = Other specific flags may be required to properly define the results. If used, they must be fully described, and such description attached to the Sample Data Summary Package and the SDG Narrative. Begin by using "X". If more than one flag is required, use "Y" and "Z" as needed. If more than five qualifiers are required for a sample result, use the "X" flag to combine several flags, as needed. For instance, the "X" flag might combine the "A", "B", and "D" flags for some sample. The laboratory-defined flags are limited to the letters "X", "Y", and "Z".
- R = This flag is used for polyaromatic hydrocarbons which show target compounds that do not meet secondary ion confirmation. In some instances a compound that does not meet secondary ion confirmation criteria may still be determined to be present in the sample after close inspection of the data by the analyst. Supportive data includes mass chromatograms maxima at the same scan for primary and secondary ions, as well as discernible quantitation interference with the secondary ion.



☐ Rocky Mountain Analytical Laboratory
4955 Yarrow Street
Arvada, CO 80002
303/421-6611 FAX: 303/431-7171

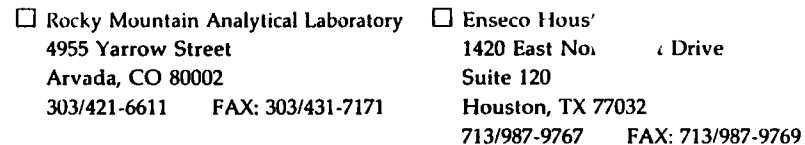
☐ Enseco Hous
1420 East North Belt Drive
Suite 120
Houston, TX 77032
713/987-9767 FAX: 713/987-9769

CHAIN OF CUSTODY

ENSECO CLIENT		SAMPLE SAFE™ CONDITIONS	
PROJECT <u>CITY OF ST LOUIS PARK (WATER DEPT)</u>		PACKED BY <u>MZK</u>	SEAL NUMBER
SAMPLING COMPANY <u>SAME</u>		SEAL INTACT UPON RECEIPT BY SAMPLING COMPANY	CONDITION OF CONTENTS
SAMPLING SITE <u>SAME</u>		SEALED FOR SHIPPING BY <u>MZK</u>	INITIAL CONTENTS TEMP. °C
TEAM LEADER <u>MZK</u>		SEAL NUMBER	SAMPLING STATUS <input type="checkbox"/> Done <input type="checkbox"/> Continuing Until
		SEAL INTACT UPON RECEIPT BY LAB. <input type="checkbox"/> Yes <input type="checkbox"/> No	CONTENTS TEMPERATURE UPON RECEIPT BY LAB. 7.5 °C

DATE	TIME	SAMPLE ID/DESCRIPTION	SAMPLE TYPE	# CONTAINERS	ANALYSIS PARAMETERS	REMARKS
1-11-93		ISV-W105 - 011193 OISA	IXL NUMBER	6	PPT PAH	PPT 75
1-11-93		ISV-W105D - 011193 OIDU	IXL NUMBER	6	PPT PAH	PPT 75

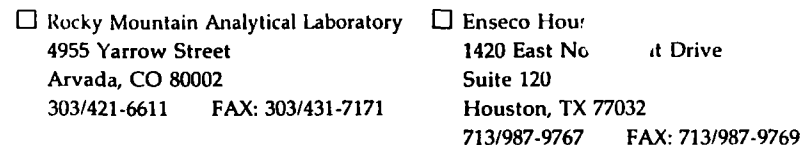
CUSTODY TRANSFERS PRIOR TO SHIPPING				SHIPPING DETAILS	
RELINQUISHED BY (SIGNED)	RECEIVED BY (SIGNED)	DATE	TIME	DELIVERED TO SHIPPER BY <u>MZK</u>	
				METHOD OF SHIPMENT <u>FED EX</u>	AIRBILL NUMBER <u>2103420594</u>
				RECEIVED FOR LAB <u>ENSECO - RMAL</u>	SIGNED <u>Alexandra E. Hall</u>
				ENSECO PROJECT NUMBER <u>27112</u>	DATE/TIME <u>0830 12 JAN 93</u>



ENSECO CLIENT <i>CITY OF ST LOUIS PARK (WATER DEPT)</i>		PACKED BY <i>MZK</i>		SEAL NUMBER	
PROJECT		SEAL INTACT UPON RECEIPT BY SAMPLING COMPANY		CONDITION OF CONTENTS	
SAMPLING COMPANY		SEALED FOR SHIPPING BY <i>MZK</i>		INITIAL CONTENTS TEMP. °C	
SAMPLING SITE <i>SAME</i>		SAMPLING NUMBER		SAMPLING STATUS <input type="checkbox"/> Done <input type="checkbox"/> Continuing Until	
TEAM LEADER <i>MZK</i>		SEAL INTACT UPON RECEIPT BY LAB. <input type="checkbox"/> Yes <input type="checkbox"/> No		CONTENTS TEMPERATURE UPON RECEIPT BY LAB. °C	

[illegible]

CUSTODY TRANSFERS PRIOR TO SHIPPING				SHIPPING DETAILS		
RELINQUISHED BY (SIGNED)	RECEIVED BY (SIGNED)	DATE	TIME	DELIVERED TO SHIPPER BY <i>[Signature]</i>		
				METHOD OF SHIPMENT <i>FED EX</i>	AIRBILL NUMBER <i>2103420594</i>	
				RECEIVED FOR LAB <i>Enseco - RMAL</i>	SIGNED <i>Alexandre C. Hall</i>	DATE/TIME <i>0830 12 JAN 93</i>
				ENSECO PROJECT NUMBER <i>27112</i>		



ENSECO CLIENT <i>CITY OF ST LOUIS PARK (WATER DEPT)</i>		PACKED BY <i>MZK</i>		SEAL NUMBER
PROJECT		SEAL INTACT UPON RECEIPT BY SAMPLING COMPANY		CONDITION OF CONTENTS
SAMPLING COMPANY		SEALED FOR SHIPPING BY <i>MZK</i>		INITIAL CONTENTS TEMP. °C
SAMPLING SITE <i>SAME</i>		SEAL NUMBER	SAMPLING STATUS <input type="checkbox"/> Done <input type="checkbox"/> Continuing Until	
TEAM LEADER <i>MZK</i>		SEAL INTACT UPON RECEIPT BY LAB. <input type="checkbox"/> Yes <input type="checkbox"/> No		CONTENTS TEMPERATURE UPON RECEIPT BY LAB. °C

[illegible]

CUSTODY TRANSFERS PRIOR TO SHIPPING				SHIPPING DETAILS		
RELINQUISHED BY (SIGNED)	RECEIVED BY (SIGNED)	DATE	TIME	DELIVERED TO SHIPPER BY M2K		
				METHOD OF SHIPMENT FED EX		AIRBILL NUMBER 2103420594
				RECEIVED FOR LAB ENSECO - RMAL	SIGNED Alexandra C. Hall	DATE/TIME 0830 12 JAN 93
				ENSECO PROJECT NUMBER 27112		

White - CLIENT Pink - LAB

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

27112-01

Lab Name: ENSECO

Contract No.:

IGV-W105-011193

Lab Code: ENSECO Case No.: 27112 SAS No.:

SDG No.:

Matrix: (soil/water) WATER

Lab Sample ID: 27112-01

Sample wt/vol: 4200 (g/ml) ML

Lab File ID: C7194

Level: (low/med) LOW

Date Received: 01/12/93

% Moisture: not dec. dec.

Date Extracted: 01/12/93

Extraction: (SepF/Cont/Sonc) CONT

Date Analyzed: 01/19/93

GPC Cleanup: (Y/N) N pH: 7.0

Dilution Factor: 0.119

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND	CONCENTRATION UNITS: NG/L	Q
271-89-6	2,3-Benzofuran	1.9	JR
496-11-7	2,3-Dihydroindene	160	E
95-13-6	1H-Indene	19	
91-20-3	Naphthalene	120	BRT
4565-32-6	Benzo(B)Thiophene	43	
91-22-5	Quinoline	3.5	R
120-72-9	1H-Indole	7.9	
91-57-6	2-Methylnaphthalene	67	
90-12-0	1-Methylnaphthalene	63	
92-52-4	Biphenyl	52	
208-96-8	Acenaphthylene	48	
83-32-9	Acenaphthene	160	E
132-64-9	Dibenzofuran	87	
86-73-7	Fluorene	120	
132-65-0	Dibenzothiophene	20	
85-01-8	Phenanthrene	160	BERT
120-12-7	Anthracene	68	
260-94-6	Acridine	31	
86-74-8	Carbazole	71	
206-44-0	Fluoranthene	160	BERT
129-00-0	Pyrene	150	BERT
56-55-3	Benzo(A)Anthracene	19	R
218-01-9	Chrysene	11	
205-99-2	Benzo(B)Fluoranthene	1.8	J
207-08-9	Benzo(K)Fluoranthene	2.2	U
192-97-2	Benzo(E)Pyrene	1.8	U
50-32-8	Benzo(A)Pyrene	1.2	J
198-55-0	Perylene	2.4	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.0	U
53-70-3	Dibenz(A,H)Anthracene	1.5	U
191-24-2	Benzo(G,H,I)Perylene	2.0	J

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

27112-01DL

Lab Name: ENSECO

Contract No.:

IGV-W105-011193

Lab Code: ENSECO Case No.: 27112 SAS No.:

SDG No.:

Matrix: (soil/water) WATER

Lab Sample ID: 27112-01DL

Sample wt/vol: 4200 (g/ml) ML

Lab File ID: C7214

Level: (low/med) LOW

Date Received: 01/12/93

% Moisture: not dec. dec.

Date Extracted: 01/12/93

Extraction: (SepF/Cont/Sonc) CONT

Date Analyzed: 01/21/93

GPC Cleanup: (Y/N) N pH: 7.0

Dilution Factor: 0.476

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND	CONCENTRATION UNITS: NG/L	Q
271-89-6-----	2,3-Benzofuran-----	19	U
496-11-7-----	2,3-Dihydroindene-----	210	
95-13-6-----	1H-Indene-----	23	
91-20-3-----	Naphthalene-----	180	B
4565-32-6-----	Benzo(B)Thiophene-----	48	
91-22-5-----	Quinoline-----	5.3	U
120-72-9-----	1H-Indole-----	5.1	J
91-57-6-----	2-Methylnaphthalene-----	63	
90-12-0-----	1-Methylnaphthalene-----	65	
92-52-4-----	Biphenyl-----	51	
208-96-8-----	Acenaphthylene-----	37	
83-32-9-----	Acenaphthene-----	160	
132-64-9-----	Dibenzofuran-----	85	
86-73-7-----	Fluorene-----	110	
132-65-0-----	Dibenzothiophene-----	17	
85-01-8-----	Phenanthrene-----	220	B
120-12-7-----	Anthracene-----	47	
260-94-6-----	Acridine-----	19	
86-74-8-----	Carbazole-----	47	
206-44-0-----	Fluoranthene-----	230	B
129-00-0-----	Pyrene-----	180	B
56-55-3-----	Benzo(A)Anthracene-----	22	R
218-01-9-----	Chrysene-----	16	
205-99-2-----	Benzo(B)Fluoranthene-----	9.5	U
207-08-9-----	Benzo(K)Fluoranthene-----	8.8	U
192-97-2-----	Benzo(E)Pyrene-----	7.2	U
50-32-8-----	Benzo(A)Pyrene-----	8.8	U
198-55-0-----	Perylene-----	9.5	U
193-39-5-----	Indeno(1,2,3-CD)Pyrene-----	8.0	U
53-70-3-----	Dibenz(A,H)Anthracene-----	6.1	U
191-24-2-----	Benzo(G,H,I)Perylene-----	11	U

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

27112-01DU

Lab Name: ENSECO

Contract No.:

IGV-W105D-011193

Lab Code: ENSECO Case No.: 27112 SAS No.:

SDG No.:

Matrix: (soil/water) WATER

Lab Sample ID: 27112-01DU

Sample wt/vol: 4200 (g/ml) ML

Lab File ID: C7195

Level: (low/med) LOW

Date Received: 01/12/93

% Moisture: not dec. dec.

Date Extracted: 01/12/93

Extraction: (SepF/Cont/Sonc) CONT

Date Analyzed: 01/19/93

GPC Cleanup: (Y/N) N pH: 7.0

Dilution Factor: 0.119

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND	CONCENTRATION UNITS: NG/L	Q
271-89-6	2,3-Benzofuran	2.2	JR
496-11-7	2,3-Dihydroindene	180	E
95-13-6	1H-Indene	21	
91-20-3	Naphthalene	130	BRT
4565-32-6	Benzo(B)Thiophene	44	
91-22-5	Quinoline	5.6	R
120-72-9	1H-Indole	8.4	
91-57-6	2-Methylnaphthalene	66	
90-12-0	1-Methylnaphthalene	61	
92-52-4	Biphenyl	50	
208-96-8	Acenaphthylene	47	
83-32-9	Acenaphthene	160	E
132-64-9	Dibenzofuran	85	
86-73-7	Fluorene	110	
132-65-0	Dibenzothiophene	19	R
85-01-8	Phenanthrene	160	BERT
120-12-7	Anthracene	68	
260-94-6	Acridine	30	
86-74-8	Carbazole	67	
206-44-0	Fluoranthene	170	BERT
129-00-0	Pyrene	150	BERT
56-55-3	Benzo(A)Anthracene	14	R
218-01-9	Chrysene	9.8	
205-99-2	Benzo(B)Fluoranthene	2.4	
207-08-9	Benzo(K)Fluoranthene	1.0	JR
192-97-2	Benzo(E)Pyrene	1.8	U
50-32-8	Benzo(A)Pyrene	1.4	J
198-55-0	Perylene	2.4	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.0	U
53-70-3	Dibenz(A,H)Anthracene	1.5	U
191-24-2	Benzo(G,H,I)Perylene	1.4	J

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

27112-01DUDL

Lab Name: ENSECO

Contract No.:

IGV-W105D-011193

Lab Code: ENSECO Case No.: 27112 SAS No.:

SDG No.:

Matrix: (soil/water) WATER

Lab Sample ID: 27112-01DUDL

Sample wt/vol: 4200 (g/ml) ML

Lab File ID: C7203

Level: (low/med) LOW

Date Received: 01/12/93

% Moisture: not dec. dec.

Date Extracted: 01/12/93

Extraction: (SepF/Cont/Sonc) CONT

Date Analyzed: 01/19/93

GPC Cleanup: (Y/N) N pH: 7.0

Dilution Factor: 0.476

CONCENTRATION UNITS: NG/L

CAS NO.

COMPOUND

Q

271-89-6-----	2,3-Benzofuran	19	U
496-11-7-----	2,3-Dihydroindene	160	
95-13-6-----	1H-Indene	19	
91-20-3-----	Naphthalene	160	B
4565-32-6-----	Benzo(B)Thiophene	39	
91-22-5-----	Quinoline	5.3	U
120-72-9-----	1H-Indole	5.5	J
91-57-6-----	2-Methylnaphthalene	57	
90-12-0-----	1-Methylnaphthalene	54	
92-52-4-----	Biphenyl	44	
208-96-8-----	Acenaphthylene	37	
83-32-9-----	Acenaphthene	140	
132-64-9-----	Dibenzofuran	72	
86-73-7-----	Fluorene	95	
132-65-0-----	Dibenzothiophene	13	
85-01-8-----	Phenanthrene	170	B
120-12-7-----	Anthracene	45	
260-94-6-----	Acridine	20	R
86-74-8-----	Carbazole	43	
206-44-0-----	Fluoranthene	180	B
129-00-0-----	Pyrene	140	B
56-55-3-----	Benzo(A)Anthracene	14	
218-01-9-----	Chrysene	9.5	J
205-99-2-----	Benzo(B)Fluoranthene	9.5	U
207-08-9-----	Benzo(K)Fluoranthene	8.8	U
192-97-2-----	Benzo(E)Pyrene	7.2	U
50-32-8-----	Benzo(A)Pyrene	8.8	U
198-55-0-----	Perylene	9.5	U
193-39-5-----	Indeno(1,2,3-CD)Pyrene	8.0	U
53-70-3-----	Dibenz(A,H)Anthracene	6.1	U
191-24-2-----	Benzo(G,H,I)Perylene	11	U

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

27112-01FB

Lab Name: ENSECO

Contract No.:

IGV-W105FB-011193

Lab Code: ENSECO Case No.: 27112 SAS No.:

SDG No.:

Matrix: (soil/water) WATER

Lab Sample ID: 27112-01FB

Sample wt/vol: 4200 (g/ml) ML

Lab File ID: C7199

Level: (low/med) LOW

Date Received: 01/12/93

% Moisture: not dec. dec.

Date Extracted: 01/13/93

Extraction: (SepF/Cont/Sonc) CONT

Date Analyzed: 01/19/93

GPC Cleanup: (Y/N) N pH: 7.0

Dilution Factor: 0.119

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND	CONCENTRATION UNITS: NG/L	Q
271-89-6	2,3-Benzofuran	4.9	U
496-11-7	2,3-Dihydroindene	1.3	U
95-13-6	1H-Indene	0.9	U
91-20-3	Naphthalene	3.4	BJ
4565-32-6	Benzo(B)Thiophene	0.9	U
91-22-5	Quinoline	1.6	R
120-72-9	1H-Indole	2.4	U
91-57-6	2-Methylnaphthalene	3.1	B
90-12-0	1-Methylnaphthalene	1.1	JR
92-52-4	Biphenyl	4.1	U
208-96-8	Acenaphthylene	1.3	U
83-32-9	Acenaphthene	1.2	U
132-64-9	Dibenzofuran	1.0	U
86-73-7	Fluorene	1.0	U
132-65-0	Dibenzothiophene	1.0	U
85-01-8	Phenanthrene	2.6	B
120-12-7	Anthracene	1.0	U
260-94-6	Acridine	2.8	U
86-74-8	Carbazole	1.8	U
206-44-0	Fluoranthene	1.2	J
129-00-0	Pyrene	1.4	
56-55-3	Benzo(A)Anthracene	2.4	U
218-01-9	Chrysene	2.7	U
205-99-2	Benzo(B)Fluoranthene	2.4	U
207-08-9	Benzo(K)Fluoranthene	2.2	U
192-97-2	Benzo(E)Pyrene	1.8	U
50-32-8	Benzo(A)Pyrene	2.2	U
198-55-0	Perylene	2.4	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.0	U
53-70-3	Dibenz(A,H)Anthracene	1.5	U
191-24-2	Benzo(G,H,I)Perylene	2.7	U

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BLK01

Lab Name: ENSECO

Contract No.:

Lab Code: ENSECO Case No.: 27112 SAS No.: SDG No.:

Matrix: (soil/water) WATER Lab Sample ID: BL011293

Sample wt/vol: 4000 (g/ml) ML Lab File ID: C7201

Level: (low/med) LOW Date Received:

% Moisture: not dec. dec. Date Extracted: 01/12/93

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 01/19/93

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.125

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND	Q
271-89-6	2,3-Benzofuran	5.1 U
496-11-7	2,3-Dihydroindene	1.4 U
95-13-6	1H-Indene	0.9 U
91-20-3	Naphthalene	1.1 J
4565-32-6	Benzo(B)Thiophene	0.9 U
91-22-5	Quinoline	1.4 U
120-72-9	1H-Indole	2.5 U
91-57-6	2-Methylnaphthalene	0.9 U
90-12-0	1-Methylnaphthalene	1.6 U
92-52-4	Biphenyl	4.3 U
208-96-8	Acenaphthylene	1.4 U
83-32-9	Acenaphthene	1.3 U
132-64-9	Dibenzofuran	1.0 U
86-73-7	Fluorene	1.0 U
132-65-0	Dibenzothiophene	1.1 U
85-01-8	Phenanthrene	2.7 U
120-12-7	Anthracene	1.1 U
260-94-6	Acridine	2.9 U
86-74-8	Carbazole	1.9 U
206-44-0	Fluoranthene	1.3 J
129-00-0	Pyrene	1.4 U
56-55-3	Benzo(A)Anthracene	2.5 U
218-01-9	Chrysene	2.8 U
205-99-2	Benzo(B)Fluoranthene	2.5 U
207-08-9	Benzo(K)Fluoranthene	2.3 U
192-97-2	Benzo(E)Pyrene	1.9 U
50-32-8	Benzo(A)Pyrene	2.3 U
198-55-0	Perylene	2.5 U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.1 U
53-70-3	Dibenz(A,H)Anthracene	1.6 U
191-24-2	Benzo(G,H,I)Perylene	2.8 U

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BLK02

Lab Name: ENSECO

Contract No.:

Lab Code: ENSECO Case No.: 27112 SAS No.: SDG No.:

Matrix: (soil/water) WATER

Lab Sample ID: BL011393

Sample wt/vol: 4000 (g/ml) ML

Lab File ID: C7202

Level: (low/med) LOW

Date Received:

% Moisture: not dec. dec.

Date Extracted: 01/13/93

Extraction: (SepF/Cont/Sonc) CONT

Date Analyzed: 01/19/93

GPC Cleanup: (Y/N) N pH: 7.0

Dilution Factor: 0.125

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND	Q
271-89-6	2,3-Benzofuran	U
496-11-7	2,3-Dihydroindene	U
95-13-6	1H-Indene	U
91-20-3	Naphthalene	J
4565-32-6	Benzo(B)Thiophene	U
91-22-5	Quinoline	U
120-72-9	1H-Indole	U
91-57-6	2-Methylnaphthalene	U
90-12-0	1-Methylnaphthalene	U
92-52-4	Biphenyl	U
208-96-8	Acenaphthylene	U
83-32-9	Acenaphthene	U
132-64-9	Dibenzofuran	U
86-73-7	Fluorene	U
132-65-0	Dibenzothiophene	U
85-01-8	Phenanthrene	U
120-12-7	Anthracene	U
260-94-6	Acridine	U
86-74-8	Carbazole	U
206-44-0	Fluoranthene	U
129-00-0	Pyrene	U
56-55-3	Benzo(A)Anthracene	U
218-01-9	Chrysene	U
205-99-2	Benzo(B)Fluoranthene	U
207-08-9	Benzo(K)Fluoranthene	U
192-97-2	Benzo(E)Pyrene	U
50-32-8	Benzo(A)Pyrene	U
198-55-0	Perylene	U
193-39-5	Indeno(1,2,3-CD)Pyrene	U
53-70-3	Dibenz(A,H)Anthracene	U
191-24-2	Benzo(G,H,I)Perylene	U

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

27112-01MS

Lab Name: ENSECO

Contract No.:

IGV-W105MS-011193

Lab Code: ENSECO Case No.: 27112 SAS No.:

SDG No.:

Matrix: (soil/water) WATER

Lab Sample ID: 27112-01MS

Sample wt/vol: 4200 (g/ml) ML

Lab File ID: C7196

Level: (low/med) LOW

Date Received: 01/12/93

% Moisture: not dec. dec.

Date Extracted: 01/12/93

Extraction: (SepF/Cont/Sonc) CONT

Date Analyzed: 01/19/93

GPC Cleanup: (Y/N) N pH: 7.0

Dilution Factor: 0.119

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND	CONCENTRATION UNITS: NG/L	Q
271-89-6	2,3-Benzofuran	2.7	J
496-11-7	2,3-Dihydroindene	180	E
95-13-6	1H-Indene	75	
91-20-3	Naphthalene	140	BRT
4565-32-6	Benzo(B)Thiophene	53	
91-22-5	Quinoline	170	E
120-72-9	1H-Indole	11	
91-57-6	2-Methylnaphthalene	140	
90-12-0	1-Methylnaphthalene	79	
92-52-4	Biphenyl	62	
208-96-8	Acenaphthylene	56	
83-32-9	Acenaphthene	170	E
132-64-9	Dibenzofuran	100	
86-73-7	Fluorene	160	E
132-65-0	Dibenzothiophene	25	
85-01-8	Phenanthrene	170	BERT
120-12-7	Anthracene	82	
260-94-6	Acridine	39	
86-74-8	Carbazole	87	
206-44-0	Fluoranthene	180	BERT
129-00-0	Pyrene	170	BERT
56-55-3	Benzo(A)Anthracene	19	R
218-01-9	Chrysene	37	
205-99-2	Benzo(B)Fluoranthene	2.5	
207-08-9	Benzo(K)Fluoranthene	1.0	JR
192-97-2	Benzo(E)Pyrene	5.6	
50-32-8	Benzo(A)Pyrene	1.6	J
198-55-0	Perylene	2.4	U
193-39-5	Indeno(1,2,3-CD)Pyrene	2.0	U
53-70-3	Dibenz(A,H)Anthracene	1.5	U
191-24-2	Benzo(G,H,I)Perylene	1.1	J

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

27112-01MSDL

Lab Name: ENSECO

Contract No.:

IGV-W105MS-011193

Lab Code: ENSECO Case No.: 27112 SAS No.:

SDG No.:

Matrix: (soil/water) WATER

Lab Sample ID: 27112-01MSDL

Sample wt/vol: 4200 (g/ml) ML

Lab File ID: C7204

Level: (low/med) LOW

Date Received: 01/12/93

% Moisture: not dec. dec.

Date Extracted: 01/12/93

Extraction: (SepF/Cont/Sonc) CONT

Date Analyzed: 01/19/93

GPC Cleanup: (Y/N) N pH: 7.0

Dilution Factor: 0.476

CONCENTRATION UNITS: NG/L

CAS NO.

COMPOUND

Q

271-89-6-----	2,3-Benzofuran	19	U
496-11-7-----	2,3-Dihydroindene	170	
95-13-6-----	1H-Indene	67	
91-20-3-----	Naphthalene	270	B
4565-32-6-----	Benzo(B)Thiophene	47	
91-22-5-----	Quinoline	140	
120-72-9-----	1H-Indole	8.5	J
91-57-6-----	2-Methylnaphthalene	130	
90-12-0-----	1-Methylnaphthalene	72	
92-52-4-----	Biphenyl	60	
208-96-8-----	Acenaphthylene	52	
83-32-9-----	Acenaphthene	190	
132-64-9-----	Dibenzofuran	110	
86-73-7-----	Fluorene	210	
132-65-0-----	Dibenzothiophene	21	
85-01-8-----	Phenanthrene	270	B
120-12-7-----	Anthracene	68	
260-94-6-----	Acridine	31	R
86-74-8-----	Carbazole	70	
206-44-0-----	Fluoranthene	270	B
129-00-0-----	Pyrene	210	B
56-55-3-----	Benzo(A)Anthracene	19	R
218-01-9-----	Chrysene	37	
205-99-2-----	Benzo(B)Fluoranthene	9.5	U
207-08-9-----	Benzo(K)Fluoranthene	8.8	U
192-97-2-----	Benzo(E)Pyrene	5.7	J
50-32-8-----	Benzo(A)Pyrene	8.8	U
198-55-0-----	Perylene	9.5	U
193-39-5-----	Indeno(1,2,3-CD)Pyrene	8.0	U
53-70-3-----	Dibenz(A,H)Anthracene	6.1	U
191-24-2-----	Benzo(G,H,I)Perylene	11	U

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

27112-01MSD

Lab Name: ENSECO

Contract No.:

Lab Code: ENSECO Case No.: 27112 SAS No.:

IGV-W105MSD-011193
SDG No.:

Matrix: (soil/water) WATER

Lab Sample ID: 27112-01MSD

Sample wt/vol: 4130 (g/ml) ML

Lab File ID: C7197

Level: (low/med) LOW

Date Received: 01/12/93

% Moisture: not dec. dec.

Date Extracted: 01/12/93

Extraction: (SepF/Cont/Sonc) CONT

Date Analyzed: 01/19/93

GPC Cleanup: (Y/N) N pH: 7.0

Dilution Factor: 0.121

CONCENTRATION UNITS: NG/L

CAS NO.

COMPOUND

Q

271-89-6-----	2,3-Benzofuran	2.2	JR
496-11-7-----	2,3-Dihydroindene	160	E
95-13-6-----	1H-Indene	66	
91-20-3-----	Naphthalene	130	BERT
4565-32-6-----	Benzo(B)Thiophene	45	
91-22-5-----	Quinoline	170	E
120-72-9-----	1H-Indole	8.3	
91-57-6-----	2-Methylnaphthalene	120	
90-12-0-----	1-Methylnaphthalene	69	
92-52-4-----	Biphenyl	57	
208-96-8-----	Acenaphthylene	55	
83-32-9-----	Acenaphthene	170	E
132-64-9-----	Dibenzofuran	96	
86-73-7-----	Fluorene	170	E
132-65-0-----	Dibenzothiophene	21	R
85-01-8-----	Phenanthrene	180	BERT
120-12-7-----	Anthracene	78	
260-94-6-----	Acridine	35	R
86-74-8-----	Carbazole	78	
206-44-0-----	Fluoranthene	180	BERT
129-00-0-----	Pyrene	150	BERT
56-55-3-----	Benzo(A)Anthracene	14	R
218-01-9-----	Chrysene	27	
205-99-2-----	Benzo(B)Fluoranthene	1.7	JR
207-08-9-----	Benzo(K)Fluoranthene	2.2	U
192-97-2-----	Benzo(E)Pyrene	4.6	
50-32-8-----	Benzo(A)Pyrene	2.2	U
198-55-0-----	Perylene	2.0	U
193-39-5-----	Indeno(1,2,3-CD)Pyrene	2.0	U
53-70-3-----	Dibenz(A,H)Anthracene	1.5	U
191-24-2-----	Benzo(G,H,I)Perylene	2.7	U

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

27112-01MSDDL

Lab Name: ENSECO

Contract No.:

IGV-W105MSD-011193

Lab Code: ENSECO Case No.: 27112 SAS No.:

SDG No.:

Matrix: (soil/water) WATER

Lab Sample ID: 27112-01MSDDL

Sample wt/vol: 4130 (g/ml) ML

Lab File ID: C7205

Level: (low/med) LOW

Date Received: 01/12/93

% Moisture: not dec. dec.

Date Extracted: 01/12/93

Extraction: (SepF/Cont/Sonc) CONT

Date Analyzed: 01/19/93

GPC Cleanup: (Y/N) N pH: 7.0

Dilution Factor: 0.484

CONCENTRATION UNITS: NG/L

CAS NO.	COMPOUND	CONCENTRATION UNITS: NG/L	Q
271-89-6	2,3-Benzofuran	19	U
496-11-7	2,3-Dihydroindene	210	
95-13-6	1H-Indene	80	
91-20-3	Naphthalene	280	B
4565-32-6	Benzo(B)Thiophene	53	
91-22-5	Quinoline	160	
120-72-9	1H-Indole	7.9	J
91-57-6	2-Methylnaphthalene	140	
90-12-0	1-Methylnaphthalene	75	
92-52-4	Biphenyl	59	
208-96-8	Acenaphthylene	51	
83-32-9	Acenaphthene	180	
132-64-9	Dibenzofuran	96	
86-73-7	Fluorene	180	
132-65-0	Dibenzothiophene	18	
85-01-8	Phenanthrene	250	B
120-12-7	Anthracene	60	
260-94-6	Acridine	27	
86-74-8	Carbazole	60	
206-44-0	Fluoranthene	260	B
129-00-0	Pyrene	210	B
56-55-3	Benzo(A)Anthracene	13	R
218-01-9	Chrysene	27	
205-99-2	Benzo(B)Fluoranthene	9.7	U
207-08-9	Benzo(K)Fluoranthene	8.9	U
192-97-2	Benzo(E)Pyrene	4.6	J
50-32-8	Benzo(A)Pyrene	8.9	U
198-55-0	Perylene	9.7	U
193-39-5	Indeno(1,2,3-CD)Pyrene	8.1	U
53-70-3	Dibenz(A,H)Anthracene	6.2	U
191-24-2	Benzo(G,H,I)Perylene	11	U

2C
WATER SEMIVOLATILE SURROGATE RECOVERY

Lab Name: ENSECO

Contract:

Lab Code: ENSECO

Case No.: 27112

SAS No.:

SDG No.:

Level: LOW

	EPA SAMPLE NO.	S1 (NAP) #	S2 (FLU) #	S3 (CHR) #
1	27112-01	71	93	36
2	27112-01DL	75	82	64
3	27112-01DU	74	94	32
4	27112-01DUDL	68	76	52
5	27112-01MS	84	98	37
6	27112-01MSDL	75	103	49
7	27112-01MSD	70	97	26
8	27112-01MSDDL	82	90	36
9	27112-01FB	80	102	72
10	BLK01	87	98	74
11	BLK02	85	116	86

S1 (NAP) = D8-NAPHTHALENE	QC LIMITS
S2 (FLU) = D10-FLUORENE	(14-108)
S3 (CHR) = D12-CHRYSENE	(41-162)
	(10-118)

Column to be used to flag recovery values

* Values outside of contract required QC limits

D Surrogates diluted out

3C
WATER SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: ENSECO

Contract:

Lab Code: ENSECO

Case No.: 27112

SAS No.:

SDG No.:

Matrix Spike - EPA Sample No.: 27113-01

LEVEL: LOW

Compound	SPIKE ADDED (ng/L)	SAMPLE CONCENTRATION (ng/L)	MS CONCENTRATION (ng/L)	MS % REC
1H-Indene	71.4	19.4	75.4	78
Naphthalene	71.4	118 #	136 #	25
Quinoline	71.4	3.51	175 #	240*
2-Methylnaphthalene	71.4	66.8	141	104
Fluorene	71.4	115	162 #	66
Chrysene	71.4	10.7	37.2	37
Benzo(E)Pyrene	71.4	ND	5.63	8*

Compound	SPIKE ADDED (ng/L)	MSD CONCENTRATION (ng/L)	MSD % REC	% RPD
1H-Indene	72.6	66.3	65	18
Naphthalene	72.6	135 #	23	8
Quinoline	72.6	170 #	229 *	5
2-Methylnaphthalene	72.6	125	80	26
Fluorene	72.6	173 #	80	19
Chrysene	72.6	27.2	23	47 *
Benzo(E)Pyrene	72.6	4.58	6 *	29 *

Comments: * Indicates that a value is outside QC limits
This compound is saturated and/or out of linear range

WATER SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: ENSECO

Contract:

Lab Code: ENSECO

Case No.: 27112

SAS No.:

SDG No.:

Matrix Spike - EPA Sample No.: 27112-01DL LEVEL: LOW

Compound	SPIKE ADDED (ng/L)	SAMPLE CONCENTRATION (ng/L)	MS CONCENTRATION (ng/L)	MS % REC
1H-Indene	71.4	23.0	67.1	62
Naphthalene	71.4	183	269	120
Quinoline	71.4	3.25	141	193*
2-Methylnaphthalene	71.4	62.9	129	93
Fluorene	71.4	109	206	136
Chrysene	71.4	16.3	37.4	30
Benzo(E)Pyrene	71.4	1.24	5.66	6*

Compound	SPIKE ADDED (ng/L)	MSD CONCENTRATION (ng/L)	MSD % REC	% RPD
1H-Indene	72.6	80.4	79	24
Naphthalene	72.6	284	139	15
Quinoline	72.6	161	217 *	12
2-Methylnaphthalene	72.6	136	101	8
Fluorene	72.6	185	105	26
Chrysene	72.6	27.3	15 *	67 *
Benzo(E)Pyrene	72.6	4.60	5 *	18

Comments: * indicates that a value is outside QC limits

4B
SEMIVOLATILE METHOD BLANK SUMMARY

BLK01

Lab Name: ENSECO

Contract:

Lab Code: ENSECO

Case No.: 27112

SAS No.:

SDG No.:

Lab File ID: C7201

Lab Sample ID: BL011293

Instrument ID: 4500-C

Date Extracted: 01/12/93

Matrix: (soil/water) WATER

Date Analyzed: 01/19/93

Level: (low/med) LOW

Time Analyzed: 1808

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
=====	=====	=====	=====
27112-01	27112-01	C7194	01/19/93
27112-01DL	27112-01DL	C7214	01/21/93
27112-01DU	27112-01DU	C7195	01/19/93
27112-01DUDL	27112-01DUDL	C7203	01/19/93
27112-01MS	27112-01MS	C7196	01/19/93
27112-01MSDL	27112-01MSDL	C7204	01/19/93
27112-01MSD	27112-01MSD	C7197	01/19/93
27112-01MSDDL	27112-01MSDDL	C7205	01/19/93

Comments:

4B
SEMIVOLATILE METHOD BLANK SUMMARY

BLK02

Lab Name: ENSECO

Contract:

Lab Code: ENSECO Case No.: 27112 SAS No.: SDG No.:

Lab File ID: C7202

Lab Sample ID: BL011393

Instrument ID: 4500-C

Date Extracted: 01/13/93

Matrix: (soil/water) WATER

Date Analyzed: 01/19/93

Level:(low/med) LOW

Time Analyzed: 1857

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

CSLP SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
=====	=====	=====	=====
27112-01FB	27112-01FB	C7199	01/19/93

Comments:

5B
SEMIVOLATILE ORGANIC GC/MS PAH

Lab Name: ENSECO

Contract No:

Lab Code: ENSECO

Case No: 27112

SAS No:

SDG No:

THIS PERFORMANCE TUNE APPLIES TO THE FOLLOWING SAMPLES, BLANKS AND STANDARDS

SAMPLE ID	LAB FILE ID	DATE OF ANALYSIS	TIME OF ANALYSIS
20_PPb_PAH_STD	C6956	12/10/92	0947
1200_PPb_PAH_STD	C6957	12/10/92	1037
600_PPb_PAH_STD	C6958	12/10/92	1127
240_PPb_PAH_STD	C6959	12/10/92	1218
40_PPb_PAH_STD	C6960	12/10/92	1310

5B
SEMIVOLATILE ORGANIC GC/MS PAH

Lab Name: ENSECO

Contract No:

Lab Code: ENSECO

Case No: 27112 SAS No:

SDG No:

THIS PERFORMANCE TUNE APPLIES TO THE FOLLOWING SAMPLES, BLANKS AND STANDARDS

SAMPLE ID	LAB FILE ID	DATE OF ANALYSIS	TIME OF ANALYSIS
40_PPb_PAH_STD	C7209	01/21/93	0949
20_PPb_PAH_STD	C7210	01/21/93	1047
1200_PPb_PAH_STD	C7211	01/21/93	1137
600_PPb_PAH_STD	C7212	01/21/93	1227
240_PPb_PAH_STD	C7213	01/21/93	1317

5B
SEMIVOLATILE ORGANIC GC/MS PAH

Lab Name: ENSECO

Contract No:

Lab Code: ENSECO

Case No: 27112 SAS No:

SDG No:

THIS PERFORMANCE TUNE APPLIES TO THE FOLLOWING SAMPLES, BLANKS AND STANDARDS

SAMPLE ID	LAB FILE ID	DATE OF ANALYSIS	TIME OF ANALYSIS
40 PPB PAH STD	C7193	01/19/93	1029
27112-01	C7194	01/19/93	1212
27112-01DU	C7195	01/19/93	1304
27112-01MS	C7196	01/19/93	1354
27112-01MSD	C7197	01/19/93	1446
27112-01FB	C7199	01/19/93	1626
BLK01	C7201	01/19/93	1808
BLK02	C7202	01/19/93	1857
27112-01DUDL	C7203	01/19/93	1948
27112-01MSDL	C7204	01/19/93	2037
27112-01MSDDL	C7205	01/19/93	2128

5B
SEMIVOLATILE ORGANIC GC/MS PAH

Lab Name: ENSECO

Contract No:

Lab Code: ENSECO

Case No: 27112

SAS No:

SDG No:

THIS PERFORMANCE TUNE APPLIES TO THE FOLLOWING SAMPLES, BLANKS AND STANDARDS

SAMPLE ID	LAB FILE ID	DATE OF ANALYSIS	TIME OF ANALYSIS
40_PP8_PAH_STD	C7209	01/21/93	0949
27112-01DL	C7214	01/21/93	1513

INITIAL CALIBRATION DATA
PAH COMPOUNDS

b Name: RMAL

Lab Code: ENSECO

Case No:

Instrument ID: 4500-C

Calibration Date(s): 12/10/93

Maximum % RSD is 35%

Lab File ID: RRF 240= C5969		RRF 20= C6956 RRF 600= C6958		RRF 40= C6960 RRF 1200= C6957			
COMPOUND	20 PPB RRF	40 PPB RRF	240PPB RRF	600PPB RRF	1200PPB RRF	AVE RRF	%RSD
2,3-Benzofuran	0.909	1.305	1.072	0.961	1.153	1.080	14.6
2,3-Dihydroindene	0.854	1.208	0.963	0.891	1.044	0.992	14.2
1H-Indene	1.860	2.077	1.693	1.665	1.625	1.784	10.5
Naphthalene	2.248	2.825	2.296	2.589	1.747	2.341	17.3
Benzo(B)Thiophene	1.389	1.768	1.452	1.696	1.408	1.543	11.4
Quinoline	0.657	0.809	0.838	1.063	1.088	0.891	20.4
1H-Indole	1.029	1.243	1.260	1.343	1.217	1.218	9.5
2-Methylnaphthalene	1.115	1.201	1.039	1.199	1.144	1.140	5.9
1-Methylnaphthalene	1.406	1.677	1.582	1.650	1.384	1.540	8.9
Biphenyl	1.392	1.569	1.378	1.587	1.238	1.433	10.2
Acenaphthylene	1.790	1.997	1.881	2.272	1.597	1.907	13.2
Acenaphthene	1.168	1.344	1.180	1.351	1.172	1.243	7.7
Indenobenzofuran	1.636	1.767	1.637	1.842	1.410	1.658	9.9
Fluorene	1.470	1.604	1.496	1.687	1.395	1.530	7.5
Dibenzothiophene	0.856	0.983	0.908	0.973	0.754	0.895	10.5
Phenanthrene	1.087	1.210	1.071	1.173	0.819	1.072	14.3
Anthracene	0.820	0.934	0.928	1.078	0.856	0.923	10.7
Acridine	0.277	0.449	0.445	0.589	0.602	0.472	28.0
Carbazole	0.712	0.867	0.854	0.937	0.767	0.827	10.7
Fluoranthene	0.793	0.945	0.869	1.001	0.842	0.890	9.3
Pyrene	0.954	1.048	0.900	1.032	0.849	0.957	8.9
Benzo(A)Anthracene	1.509	1.577	1.726	1.971	1.992	1.755	12.6
Chrysene	1.882	1.811	1.865	2.071	1.957	1.917	5.2
Benzo(B)Fluoranthene	1.586	1.673	1.605	1.933	1.874	1.734	9.2
Benzo(K)Fluoranthene	1.504	1.622	1.454	1.540	1.588	1.542	4.3
Benzo(E)Pyrene	1.449	1.618	1.504	1.642	1.662	1.575	5.9
Benzo(A)Pyrene	1.273	1.347	1.289	1.280	1.476	1.333	6.4
Perylene	1.381	1.422	1.100	1.643	1.110	1.331	17.2
Indeno(1,2,3-CD)Pyrene	1.164	1.319	1.230	1.369	1.344	1.285	6.7
Dibenz(A,H)Anthracene	1.043	1.142	1.080	1.212	1.170	1.129	6.0
Benzo(G,H,I)Perylene	1.209	1.244	1.126	1.271	1.228	1.216	4.5
=====	=====	=====	=====	=====	=====	=====	=====
D8-Naphthalene	1.669	1.983	1.658	1.756	1.537	1.721	9.7
D10-Flourene	0.977	1.060	0.993	1.133	1.057	1.044	6.0
D12-Chrysene	1.746	1.473	1.407	1.539	1.518	1.537	8.3

INITIAL CALIBRATION DATA
PAH COMPOUNDS

b Name: RMAL

Lab Code: ENSECO

Case No:

Instrument ID: 4500-C

Calibration Date(s): 01/21/93

Maximum % RSD is 35%

Lab File ID: RRF 240= C7213		RRF 20= C7210 RRF 600= C7212		RRF 40= C7209 RRF 1200= C7211			
COMPOUND	20 PPB RRF	40 PPB RRF	240PPB RRF	600PPB RRF	1200PPB RRF	AVE RRF	%RSD
2,3-Benzofuran	0.867	0.865	0.828	0.865	1.177	0.920	15.7
2,3-Dihydroindene	0.915	0.809	0.795	0.853	1.065	0.887	12.4
1H-Indene	1.487	1.360	1.430	1.532	1.903	1.542	13.7
Naphthalene	2.354	1.989	1.931	2.235	2.287	2.159	8.7
Benzo(B)Thiophene	1.338	1.222	1.268	1.504	1.595	1.385	11.5
Quinoline	0.547	0.649	0.658	0.878	1.012	0.749	25.4
1H-Indole	0.617	0.730	0.893	1.028	1.128	0.879	23.8
2-Methylnaphthalene	0.957	0.895	0.872	1.059	1.046	0.966	8.8
1-Methylnaphthalene	1.347	1.231	1.328	1.455	1.429	1.358	6.5
Biphenyl	1.288	1.354	1.447	1.739	1.622	1.490	12.6
Acenaphthylene	1.383	1.386	1.555	1.951	1.892	1.633	16.7
Acenaphthene	1.164	1.129	1.273	1.450	1.391	1.281	10.9
Dibenzofuran	1.595	1.509	1.705	1.882	1.810	1.700	9.0
Fluorene	1.448	1.336	1.630	1.736	1.693	1.569	10.8
Dibenzothiophene	0.907	0.820	0.956	1.055	0.965	0.941	9.1
Phenanthrene	0.974	0.852	0.961	1.062	0.978	0.966	7.8
Anthracene	0.676	0.677	0.832	0.963	0.933	0.816	16.7
Acridine	0.337	0.373	0.448	0.602	0.651	0.482	28.8
Carbazole	0.558	0.652	0.774	0.887	0.910	0.756	20.0
Fluoranthene	0.759	0.883	1.050	1.129	1.159	0.996	17.1
Pyrene	1.074	1.034	1.231	1.255	1.245	1.168	9.0
Benzo(A)Anthracene	1.212	1.075	1.553	1.641	1.586	1.413	17.9
Chrysene	1.487	1.287	1.611	1.699	1.573	1.531	10.2
Benzo(B)Fluoranthene	1.596	1.549	1.626	1.833	1.704	1.662	6.7
Benzo(K)Fluoranthene	1.527	1.283	1.436	1.674	1.611	1.506	10.2
Benzo(E)Pyrene	1.614	1.481	1.546	1.747	1.607	1.599	6.2
Benzo(A)Pyrene	1.303	1.213	1.201	1.489	1.484	1.338	10.6
Perylene	1.330	1.292	1.266	1.636	1.622	1.429	12.9
Indeno(1,2,3-CD)Pyrene	1.344	1.191	1.160	1.492	1.395	1.316	10.6
Dibenz(A,H)Anthracene	1.195	1.043	1.097	1.357	1.261	1.191	10.6
Benzo(G,H,I)Perylene	1.435	1.264	1.239	1.495	1.324	1.345	7.5
=====	=====	=====	=====	=====	=====	=====	=====
D8-Naphthalene	1.330	1.266	1.242	1.465	1.572	1.375	10.2
D10-Flourene	1.012	0.969	1.143	1.268	1.211	1.121	11.4
D12-Chrysene	1.303	1.013	1.215	1.203	1.156	1.178	9.0

CONTINUING CALIBRATION DATA
PAH COMPOUNDS

5 Name: RMAL

Lab Code: ENSECO

Case No:

Instrument ID: 4500-C

Calibration Date(s): 01/19/93 Time: 1029

Lab ID: C7193

Initial Calibration Date: 12/10/92

Maximum %D is 35%

COMPOUND	INITIAL AVE RRF	40 PPB RRF	%D
2,3-Dibenzofuran	1.080	1.138	-5.4
2,3-Dihydroindene	0.992	1.117	-12.6
1H-Indene	1.784	1.830	-2.6
Naphthalene	2.341	2.360	-0.8
Benzo(B)Thiophene	1.543	1.497	3.0
Quinoline	0.891	0.693	22.2
1H-Indole	1.218	0.819	32.8
2-Methylnaphthalene	1.140	1.022	10.4
1-Methylnaphthalene	1.540	1.476	4.2
Biphenyl	1.433	1.504	-5.0
Acenaphthylene	1.907	1.588	16.7
Acenaphthene	1.243	1.226	1.4
Dibenzofuran	1.658	1.576	4.9
Fluorene	1.530	1.370	10.5
Dibenzothiophene	0.895	0.796	11.1
Phenanthrene	1.072	0.977	8.9
Anthracene	0.923	0.740	19.8
Acridine	0.472	0.339	28.2
Carbazole	0.827	0.616	25.5
Fluoranthene	0.890	0.823	7.5
Pyrene	0.957	0.932	2.6
Benzo(A)Anthracene	1.755	1.547	11.9
Chrysene	1.917	1.725	10.0
Benzo(B)Fluoranthene	1.734	1.624	6.3
Benzo(K)Fluoranthene	1.542	1.620	-5.1
Benzo(E)Pyrene	1.575	1.612	-2.3
Benzo(A)Pyrene	1.333	1.308	1.9
Perylene	1.331	1.033	22.4
Indeno(1,2,3-CD)Pyrene	1.285	1.220	5.1
Dibenz(A,H)Anthracene	1.129	1.127	0.2
Benzo(G,H,I)Perylene	1.216	0.913	24.9
=====	=====	=====	=====
D8-Naphthalene	1.721	1.723	-0.1
D10-Flourene	1.044	0.919	12.0
D12-Chrysene	1.537	1.296	15.7

CONTINUING CALIBRATION DATA
PAH COMPOUNDS

Lab Name: RMAL Lab Code: ENSECO Case No:
 Instrument ID: 4500-C Calibration Date(s): 01/21/93 Time: 0949
 Lab ID: C7209 Initial Calibration Date: 01/21/93

Maximum %D is 35%

COMPOUND	INITIAL AVE RRF	40 PPB RRF	%D
2,3-Dibenzofuran	0.920	0.865	6.0
2,3-Dihydroindene	0.887	0.809	8.8
1H-Indene	1.542	1.360	11.8
Naphthalene	2.159	1.989	7.9
Benzo(B)Thiophene	1.385	1.222	11.8
Quinoline	0.749	0.649	13.4
1H-Indole	0.879	0.730	17.0
2-Methylnaphthalene	0.966	0.895	7.3
1-Methylnaphthalene	1.358	1.231	9.4
Biphenyl	1.490	1.354	9.1
Acenaphthylene	1.633	1.386	15.1
Acenaphthene	1.281	1.129	11.9
Dibenzofuran	1.700	1.509	11.2
Fluorene	1.569	1.336	14.9
Dibenzothiophene	0.941	0.820	12.9
Phenanthrene	0.966	0.852	11.8
Anthracene	0.816	0.677	17.0
Acridine	0.482	0.373	22.6
Carbazole	0.756	0.652	13.8
Fluoranthene	0.966	0.883	11.3
Pyrene	1.168	1.034	11.5
Benzo(A)Anthracene	1.413	1.075	23.9
Chrysene	1.531	1.287	15.9
Benzo(B)Fluoranthene	1.662	1.549	6.8
Benzo(K)Fluoranthene	1.506	1.283	14.8
Benzo(E)Pyrene	1.599	1.481	7.4
Benzo(A)Pyrene	1.338	1.213	9.3
Perylene	1.429	1.292	9.6
Indeno(1,2,3-CD)Pyrene	1.316	1.191	9.5
Dibenz(A,H)Anthracene	1.191	1.043	12.4
Benzo(G,H,I)Perylene	1.345	1.264	6.0
=====	=====	=====	=====
D8-Naphthalene	1.375	1.266	7.9
D10-Flourene	1.121	0.969	13.6
D12-Chrysene	1.178	1.013	14.0

8C
SEMIVOLATILE INTERNAL STANDARD AREA SUMMARY

Lab Name: ENSECO

Contract:

Lab Code: ENSECO

Case No: 27112

SAS No.:

SDG No:

Lab File ID (Standard): C7193

Date Analyzed: 01/19/93

Instrument ID: 4500-C

Time Analyzed: 1029

	IS#1 (ACN) AREA #	IS#2 (PHN) AREA #	IS#3 (BAP) AREA #
=====	=====	=====	=====
12 HOUR STD	241504	455857	238694
=====	=====	=====	=====
UPPER LIMIT	483008	911714	477388
=====	=====	=====	=====
LOWER LIMIT	120752	227928	119347
=====	=====	=====	=====
SAMPLE NO.			
=====	=====	=====	=====
27112-01	331694	631911	239833
27112-01DU	314864	619672	284128
27112-01MS	358469	625015	269488
27112-01MSD	328040	616452	* 250240
27112-01FB	304183	602366	286259
BLK01	275444	492787	282598
BLK02	236145	504597	235356
27112-01DUDL	303969	711631	283405
27112-01MSDL	283424	649543	257830
27112-01MSDDL	252986	547175	272470

IS#1 (ACN) = D10-ACENAPHTHENE
IS#2 (PHN) = D10-PHENANTHRENE
IS#3 (BAP) = D12-BENZO(A)PYRENE

UPPER LIMIT = + 100%
of internal standard area
LOWER LIMIT = - 50%
of internal standard area

Column used to flag internal standard area values with an asterisk

8C
SEMIVOLATILE INTERNAL STANDARD AREA SUMMARY

Lab Name: ENSECO

Contract:

Lab Code: ENSECO

Case No: 27112

SAS No.:

SDG No:

Lab File ID (Standard): C7209

Date Analyzed: 01/21/93

Instrument ID: 4500-C

Time Analyzed: 0949

	IS#1 (ACN) AREA #	IS#2 (PHN) AREA #	IS#3 (BAP) AREA #
=====	=====	=====	=====
12 HOUR STD	196817	380136	314916
=====	=====	=====	=====
UPPER LIMIT	393634	760272	629832
=====	=====	=====	=====
LOWER LIMIT	98408	190068	157458
=====	=====	=====	=====
SAMPLE NO.			
=====	=====	=====	=====
27112-01DL	233060	542096	210294

IS#1 (ACN) = D10-ACENAPHTHENE
IS#2 (PHN) = D10-PHENANTHRENE
IS#3 (BAP) = D12-BENZO(A)PYRENE

UPPER LIMIT = + 100%
of internal standard area
LOWER LIMIT = - 50%
of internal standard area

Column used to flag internal standard area values with an asterisk



CASE NARRATIVE
FOR
City of St. Louis Park
February 08, 1993

Enseco - RMAL Project Number 027245

Introduction

Six aqueous samples (includes QC) were received at Enseco Rocky Mountain Analytical Laboratory on January 20, 1993. The samples were logged in under RMAL project number 027245. Sample IGV-W105FBD-011993 was extracted and held per the April 1990 QAPP. A cross reference associating the RMAL sample numbers to the actual field sample numbers is included. The samples were analyzed for low level part-per-trillion (ppt) polynuclear aromatic hydrocarbons (PAH).

Data Quality Assessment

The results contained in this report were reviewed relative to data acceptance criteria as specified in the April, 1990 QAPP for completeness, precision, accuracy, representativeness and defensibility of the data. Unless otherwise stated below, no quality control problems or technical difficulties were encountered which would impact the interpretation or use of data in this report.

PPT PAH

There were several compound recoveries that were outside of the specified matrix spike control limits. These recoveries are listed on the enclosed Forms 3C. The original analysis, without dilution, had two compounds (naphthalene and benzo(e)pyrene) that had recoveries below 20 %. According to the QAPP this MS/MSD pair is outside requirements. For the reanalysis, which was performed at a dilution, however, only benzo(e)pyrene had a recovery below 20 %. This MS/MSD pair was within the specification stated in the QAPP.

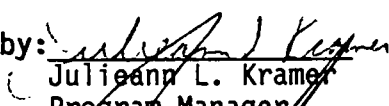
Case Narrative - RMAL #027245
February 08, 1993
Page Two

Samples 027245-0001 showed target compounds above the upper calibration range. The sample, and its associated duplicate, matrix spike and matrix spike duplicate, were reanalyzed at a 1:4 dilution. Both the original and reanalysis data are reported.

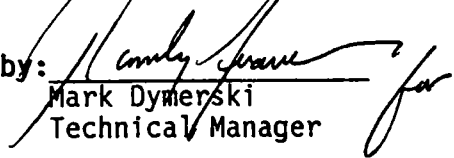
The 4800 ng/ml and the 2400 ng/ml standards had excessive saturation, therefore they were not used as the upper range for the 5-point calibration curve. Instead, the calibration curve used was, 20 ng/ml, 40 ng/ml, 240 ng/ml, 600 ng/ml, and 1200 ng/ml.

Sample 027112-001 showed target compounds that do not meet secondary ion confirmation. In some instances a compound that does not meet secondary ion confirmation criteria may still be determined to be present in the sample after close inspection of the data by the analyst. Supportive data includes mass chromatograms maxima at the same scan for primary and secondary ions, as well as discernible quantitation interference with the secondary ion. These compounds are flagged with the letter (R) on the data sheets (Form I) as per the 1990 QAPP.

This data package is in compliance with the terms and conditions of the 1990 QAPP, both technically and for completeness, for other than the conditions detailed above.

Reported by: 
Julieann L. Kramer
Program Manager

Date: Feb 08 1993

Approved by: 
Mark Dymerski
Technical Manager

Date: 2/9/93

SAMPLE DESCRIPTION INFORMATION
for
City of St. Louis Park

Lab ID	Client ID	Matrix	Sampled Date	Time	Received Date
027245-0001-SA	IGV-W105-011993	AQUEOUS	19 JAN 93		20 JAN 93
027245-0001-DU	IGV-W105D-011993	AQUEOUS	19 JAN 93		20 JAN 93
027245-0001-MS	IGV-W105MS-011993	AQUEOUS	19 JAN 93		20 JAN 93
027245-0001-SD	IGV-W105MSD-011993	AQUEOUS	19 JAN 93		20 JAN 93
027245-0001-FB	IGV-W105FB-011993	AQUEOUS	19 JAN 93		20 JAN 93
027245-0001-FD	IGV-W105FBD-011993	AQUEOUS	19 JAN 93		20 JAN 93

ANALYTICAL TEST REQUESTS
for
City of St. Louis Park

Lab ID: 027245	Group Code	Analysis Description	Custom Test?
0001 , 0001	A	Polynuclear Aromatic Hydrocarbons, SIM Low Level	N
		Prep - PAH/SIM by GC/MS Low Level	N
0001	B	Prep - PAH/SIM by GC/MS Low Level	N



Qualifier Codes and Their Usage

- U** = Indicates compound was analyzed for but not detected. The sample quantitation limit must be corrected for dilution and for percent moisture. For example, 10 U for phenol in water if the sample final volume is the protocol-specified final volume. If a 1 to 10 dilution of extract is necessary, the reported limit is 100 U. For a soil sample, the value must also be adjusted for percent moisture.
- J** = Indicates an estimated value. This flag is used either when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed, or when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the sample quantitation limit but greater than zero. For example, if the sample quantitation limit is 10 ug/L, but a concentration of 3 ug/L is calculated, report it as 3J. The sample quantitation limit must be adjusted for dilution as discussed for the U flag.
- N** = Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds, where the identification is based on a mass spectral library search. It is applied to all TIC results.
- P** = This flag is used for a pesticide/Aroclor target analyte when there is greater than 25% difference for detected concentrations between the two GC columns (see Form X). The lower of the two values is reported on Form I and flagged with a "P".
- C** = This flag applies to pesticide results where the identification has been confirmed by GC/MS. If GC/MS confirmation was attempted but was unsuccessful, do not apply this flag, instead use a laboratory-defined flag, discussed below.
- B** = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action. This flag must be used for a TIC as well as for a positively identified target compound.



Qualifier Codes and Their Usage

Page Two

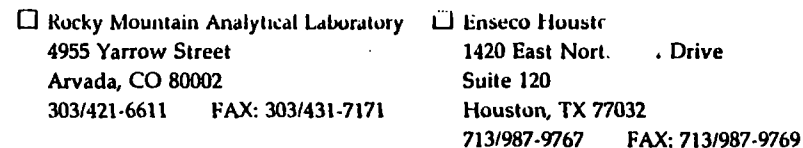
- E = This flag identifies compounds whose concentrations exceed the calibration range of the GC/MS instrument for that specific analysis. If one or more compounds have a response greater than full scale, except as noted in Exhibit D, the sample or extract must be diluted and re-analyzed accordingly to the specifications in Exhibit D. All such compounds with a response greater than full scale should have the concentration flagged with an "E" on the Form I for the original analysis. If the dilution of the extract causes any compounds identified in the first analysis to be below the calibration range in the second analysis, then the results of both analyses shall be reported on separate copies of Form I. The Form I for the diluted sample shall have the "DL" suffix appended to the sample number. NOTE: For total xylenes, where three isomers are quantified as two peaks, the calibration range of each peak should be considered separately, e.g., a diluted analysis is not required for total xylenes unless the concentration of either peak separately exceeds 200 ug/L.
- D = This flag identifies all compounds identified in an analysis at a secondary dilution factor. If a sample or extract is re-analyzed at a higher dilution factor, as in the "E" flag above, the "DL" suffix is appended to the sample number on the Form I for the diluted sample, and all concentration values reported on that Form I are flagged with the "D" flag. This flag alerts data users that any discrepancies between the concentrations reported may be due to dilution of the sample or extract.
- A = This flag indicates that a TIC is a suspected aldol-condensation product.
- X = Other specific flags may be required to properly define the results. If used, they must be fully described, and such description attached to the Sample Data Summary Package and the SDG Narrative. Begin by using "X". If more than one flag is required, use "Y" and "Z" as needed. If more than five qualifiers are required for a sample result, use the "X" flag to combine several flags, as needed. For instance, the "X" flag might combine the "A", "B", and "D" flags for some sample. The laboratory-defined flags are limited to the letters "X", "Y", and "Z".
- R = This flag is used for polyaromatic hydrocarbons which show target compounds that do not meet secondary ion confirmation. In some instances a compound that does not meet secondary ion confirmation criteria may still be determined to be present in the sample after close inspection of the data by the analyst. Supportive data includes mass chromatograms maxima at the same scan for primary and secondary ions, as well as discernible quantitation interference with the secondary ion.

CHAIN OF CUSTODY

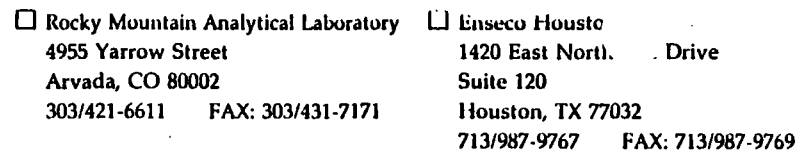
ENSECO CLIENT <i>CITY OF ST LOUIS PARK (WATER DEPT)</i>		SAMPLE SAFE™ CONDITIONS PACKED BY <i>MZB</i>	
PROJECT <i>SAME</i>		SEAL INTACT UPON RECEIPT BY SAMPLING COMPANY SEAL NUMBER <i>77245</i>	
SAMPLING COMPANY <i>SAME</i>		SEALED FOR SHIPPING BY <i>MZB</i>	
SAMPLING SITE <i>SAME</i>		INITIAL CONTENTS TEMP. °C °C	
TEAM LEADER <i>MZB</i>		SEALS STATUS <input type="checkbox"/> Done <input type="checkbox"/> Continuing Until	
		SEAL INTACT UPON RECEIPT BY LAB. <input type="checkbox"/> Yes <input type="checkbox"/> No	
		CONTENTS TEMPERATURE UPON RECEIPT BY LAB. 11.2 °C	

DATE	TIME	SAMPLE ID/DESCRIPTION	SAMPLE TYPE	# CONTAINERS	ANALYSIS PARAMETERS	REMARKS
1-19-93		TECH-NI050-011993 OISA	WATER	6	PPT PAH	PPT 75
1-19-93		TECH-NI050-011993 OISDU	WATER	6	PPT PAH	PPT 75

CUSTODY TRANSFERS PRIOR TO SHIPPING				SHIPPING DETAILS			
RELINQUISHED BY (SIGNED)	RECEIVED BY (SIGNED)	DATE	TIME	DELIVERED TO SHIPPER BY <i>MZB</i>		METHOD OF SHIPMENT <i>FEDEX</i>	
						AIRBILL NUMBER 2103420005	
				RECEIVED FOR LAB Ensco - RMA		SIGNED Alexandra E. Hall	
				ENSECO PROJECT NUMBER 27245		DATE/TIME 20 JAN 93 0900	



CHAIN OF CUSTODY				SAMPLE SAFE™ CONDITIONS			
ENSECO CLIENT				PACKED BY		SEAL NUMBER	
PROJECT				SEAL INTACT UPON RECEIPT BY SAMPLING COMPANY		CONDITION OF CONTENTS	
SAMPLING COMPANY				SEALED FOR SHIPPING BY		INITIAL CONTENTS TEMP. °C	
SAMPLING SITE				SEAL NUMBER		SAMPLING STATUS <input type="checkbox"/> Done <input type="checkbox"/> Continuing Until	
TEAM LEADER				SEAL INTACT UPON RECEIPT BY LAB. <input type="checkbox"/> Yes <input type="checkbox"/> No		CONTENTS TEMPERATURE UPON RECEIPT BY LAB. 14.0 °C	
DATE	TIME	SAMPLE ID/DESCRIPTION	SAMPLE TYPE	# CONTAINERS	ANALYSIS PARAMETERS		REMARKS
1-19-93		IGV-W105MS-011793 OMS	IXL AMBER	6	PPT PAH		PPT 75
1-19-93		IGV-W105MSD-011793 OIS	IXL AMBER	6	PPT PAH		PPT 75
CUSTODY TRANSFERS PRIOR TO SHIPPING				SHIPPING DETAILS			
RELINQUISHED BY (SIGNED)	RECEIVED BY (SIGNED)	DATE	TIME	DELIVERED TO SHIPPER BY			
				METHOD OF SHIPMENT		AIRBILL NUMBER	
				RECEIVED FOR LAB		DATE/TIME	
				ENSECO PROJECT NUMBER			



ENSECO CLIENT CITY OF ST LOUIS PARK (WATER DEPT)		PACKED BY MZK		SEAL NUMBER	
PROJECT		SEAL INTACT UPON RECEIPT BY SAMPLING COMPANY		CONDITION OF CONTENTS	
SAMPLING COMPANY		SEALED FOR SHIPPING BY MZK		INITIAL CONTENTS TEMP. °C	
SAMPLING SITE SAME		SEAL NUMBER		SAMPLING STATUS <input type="checkbox"/> Done <input type="checkbox"/> Continuing Until	
TEAM LEADER SAME		SEAL INTACT UPON RECEIPT BY LAB. <input type="checkbox"/> Yes <input type="checkbox"/> No		CONTENTS TEMPERATURE UPON RECEIPT BY LAB. 9.6 °C	

[illegible]

CUSTODY TRANSFERS PRIOR TO SHIPPING				SHIPPING DETAILS		
RELINQUISHED BY (SIGNED)	RECEIVED BY (SIGNED)	DATE	TIME	DELIVERED TO SHIPPER BY 712X		
				METHOD OF SHIPMENT FED EX	AIRBILL NUMBER 2103430605	
				RECEIVED FOR LAB EASECO-RMAL	SIGNED Alexandra C. Hall	DATE/TIME 0900 20 JAN 93
				ENSECO PROJECT NUMBER 27245		

SUMMARY

DATA

PACKAGE

FOR

CITY OF SAINT LOUIS PARK
RMAL No: 27245

1X
ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

27245-01

b Name: ENSECO

Contract:

Lab Code: ENSECO

Case No.: 27245

SAS No.:

IGV-W105-011993

SDG No.:

Matrix: (soil/water) WATER

Lab Sample ID: 27245-01

Sample wt/vol: 4200 (g/mL) ML

Lab File ID: C7218

Level: (low/med) LOW

Date Received: 01/20/93

% Moisture: decanted: (Y/N) N

Date Extracted: 01/20/93

Concentrated Extract Volume: 500(uL)

Date Analyzed: 01/22/93

Injection Volume: 2.0(uL)

Dilution Factor: 0.119

GPC Cleanup: (Y/N) N pH: 7.0

CONCENTRATION UNITS:
(ng/L or ug/Kg) ng/L

CAS NO.

COMPOUND

Q

271-89-6-----	2,3-Dibenzofuran	2	JR
496-11-7-----	2,3-Dihydroindene	140	
95-13-6-----	1H-Indene	22	
91-20-3-----	Naphthalene	92	BRT
4565-32-6-----	Benzo(B)Thiophene	48	
91-22-5-----	Quinoline	3	R
120-72-9-----	1H-Indole	10	
91-57-6-----	2-Methylnaphthalene	61	B
90-12-0-----	1-Methylnaphthalene	58	
92-52-4-----	Biphenyl	44	
208-96-8-----	Acenaphthylene	41	
83-32-9-----	Acenaphthene	130	
132-64-9-----	Dibenzofuran	69	
86-73-7-----	Fluorene	87	
132-65-0-----	Dibenzothiophene	17	
85-01-8-----	Phenanthrene	110	BRT
120-12-7-----	Anthracene	59	
260-94-6-----	Acridine	26	
86-74-8-----	Carbazole	71	
206-44-0-----	Fluoranthene	120	BRT
129-00-0-----	Pyrene	100	BRT
56-55-3-----	Benzo(A)Anthracene	15	R
218-01-9-----	Chrysene	9	
205-99-2-----	Benzo(B)Fluoranthene	3	
207-08-9-----	Benzo(K)Fluoranthene	2	U
192-97-2-----	Benzo(E)Pyrene	1	J
50-32-8-----	Benzo(A)Pyrene	1	J
198-55-0-----	Perylene	2	U
193-39-5-----	Indeno(1,2,3-CD)Pyrene	2	U
53-70-3-----	Dibenz(A,H)Anthracene	2	U
191-24-2-----	Benzo(G,H,I)Perylene	1	JR

1X
ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

27245-01DL

b Name: ENSECO

Contract:

IGV-W105-011993

Lab Code: ENSECO

Case No.: 27245

SAS No.:

SDG No.:

Matrix: (soil/water) WATER

Lab Sample ID: 27245-01DL

Sample wt/vol: 4200 (g/mL) ML

Lab File ID: C7234

Level: (low/med) LOW

Date Received: 01/20/93

% Moisture: decanted: (Y/N) N

Date Extracted: 01/20/93

Concentrated Extract Volume: 500(uL)

Date Analyzed: 01/26/93

Injection Volume: 2.0(uL)

Dilution Factor: 0.238

GPC Cleanup: (Y/N) N pH: 7.0

CONCENTRATION UNITS:
(ng/L or ug/Kg) ng/L

CAS NO.

COMPOUND

Q

271-89-6-----	2,3-Dibenzofuran	2	DJ
496-11-7-----	2,3-Dihydroindene	200	D
95-13-6-----	1H-Indene	26	D
91-20-3-----	Naphthalene	130	BDR
4565-32-6-----	Benzo(B)Thiophene	47	D
91-22-5-----	Quinoline	2	DJR
120-72-9-----	1H-Indole	8	D
91-57-6-----	2-Methylnaphthalene	56	BD
90-12-0-----	1-Methylnaphthalene	56	D
92-52-4-----	Biphenyl	42	D
208-96-8-----	Acenaphthylene	32	D
83-32-9-----	Acenaphthene	130	D
132-64-9-----	Dibenzofuran	63	D
86-73-7-----	Fluorene	78	D
132-65-0-----	Dibenzothiophene	14	DR
85-01-8-----	Phenanthrene	150	BD
120-12-7-----	Anthracene	37	D
260-94-6-----	Acridine	15	D
86-74-8-----	Carbazole	39	D
206-44-0-----	Fluoranthene	150	BD
129-00-0-----	Pyrene	130	BD
56-55-3-----	Benzo(A)Anthracene	15	DR
218-01-9-----	Chrysene	9	D
205-99-2-----	Benzo(B)Fluoranthene	3	DJR
207-08-9-----	Benzo(K)Fluoranthene	4	U
192-97-2-----	Benzo(E)Pyrene	4	U
50-32-8-----	Benzo(A)Pyrene	4	U
198-55-0-----	Perylene	5	U
193-39-5-----	Indeno(1,2,3-CD)Pyrene	4	U
53-70-3-----	Dibenz(A,H)Anthracene	3	U
191-24-2-----	Benzo(G,H,I)Perylene	5	U

1X
ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

27245-01DU

b Name: ENSECO

Contract:

IGV-W105D-011993

Lab Code: ENSECO

Case No.: 27245

SAS No.:

SDG No.:

Matrix: (soil/water) WATER

Lab Sample ID: 27245-01DU

Sample wt/vol: 4200 (g/mL) ML

Lab File ID: C7219

Level: (low/med) LOW

Date Received: 01/20/93

% Moisture: decanted: (Y/N) N

Date Extracted: 01/20/93

Concentrated Extract Volume: 500(uL)

Date Analyzed: 01/22/93

Injection Volume: 2.0(uL)

Dilution Factor: 0.119

GPC Cleanup: (Y/N) N pH: 7.0

CONCENTRATION UNITS:
(ng/L or ug/Kg) ng/L

CAS NO.

COMPOUND

Q

271-89-6-----	2,3-Dibenzofuran	2	JR
496-11-7-----	2,3-Dihydroindene	130	RT
95-13-6-----	1H-Indene	24	
91-20-3-----	Naphthalene	82	BRT
4565-32-6-----	Benzo(B)Thiophene	49	
91-22-5-----	Quinoline	4	R
120-72-9-----	1H-Indole	12	
91-57-6-----	2-Methylnaphthalene	62	B
90-12-0-----	1-Methylnaphthalene	57	
92-52-4-----	Biphenyl	45	
208-96-8-----	Acenaphthylene	42	
83-32-9-----	Acenaphthene	110	
132-64-9-----	Dibenzofuran	68	
86-73-7-----	Fluorene	87	
132-65-0-----	Dibenzothiophene	17	
85-01-8-----	Phenanthrene	100	BRT
120-12-7-----	Anthracene	57	
260-94-6-----	Acridine	25	
86-74-8-----	Carbazole	69	
206-44-0-----	Fluoranthene	88	BRT
129-00-0-----	Pyrene	78	BRT
56-55-3-----	Benzo(A)Anthracene	12	R
218-01-9-----	Chrysene	7	
205-99-2-----	Benzo(B)Fluoranthene	1	J
207-08-9-----	Benzo(K)Fluoranthene	2	U
192-97-2-----	Benzo(E)Pyrene	2	U
50-32-8-----	Benzo(A)Pyrene	2	U
198-55-0-----	Perylene	2	U
193-39-5-----	Indeno(1,2,3-CD)Pyrene	2	U
53-70-3-----	Dibenz(A,H)Anthracene	2	U
191-24-2-----	Benzo(G,H,I)Perylene	3	U

1X
ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

27245-01DUDL

b Name: ENSECO

Contract:

IGV-W105D-100993

Lab Code: ENSECO

Case No.: 27245

SAS No.:

SDG No.:

Matrix: (soil/water) WATER

Lab Sample ID: 27245-01DUDL

Sample wt/vol: 4200 (g/mL) ML

Lab File ID: C7237

Level: (low/med) LOW

Date Received: 01/20/93

% Moisture: decanted: (Y/N) N

Date Extracted: 01/20/93

Concentrated Extract Volume: 500(uL)

Date Analyzed: 01/26/93

Injection Volume: 2.0(uL)

Dilution Factor: 0.476

GPC Cleanup: (Y/N) N pH: 7.0

CONCENTRATION UNITS:
(ng/L or ug/Kg) ng/L

CAS NO.

COMPOUND

Q

271-89-6-----	2,3-Dibenzofuran	20	U
496-11-7-----	2,3-Dihydroindene	300	D
95-13-6-----	1H-Indene	38	D
91-20-3-----	Naphthalene	240	BD
4565-32-6-----	Benzo(B)Thiophene	66	D
91-22-5-----	Quinoline	5	U
120-72-9-----	1H-Indole	10	D
91-57-6-----	2-Methylnaphthalene	77	BD
90-12-0-----	1-Methylnaphthalene	76	D
92-52-4-----	Biphenyl	57	D
208-96-8-----	Acenaphthylene	41	D
83-32-9-----	Acenaphthene	170	D
132-64-9-----	Dibenzofuran	82	D
86-73-7-----	Fluorene	99	D
132-65-0-----	Dibenzothiophene	19	DR
85-01-8-----	Phenanthrene	220	BD
120-12-7-----	Anthracene	44	D
260-94-6-----	Acridine	18	D
86-74-8-----	Carbazole	49	D
206-44-0-----	Fluoranthene	200	BD
129-00-0-----	Pyrene	160	BD
56-55-3-----	Benzo(A)Anthracene	13	D
218-01-9-----	Chrysene	10	DJ
205-99-2-----	Benzo(B)Fluoranthene	10	U
207-08-9-----	Benzo(K)Fluoranthene	9	U
192-97-2-----	Benzo(E)Pyrene	7	U
50-32-8-----	Benzo(A)Pyrene	9	U
198-55-0-----	Perylene	10	U
193-39-5-----	Indeno(1,2,3-CD)Pyrene	8	U
53-70-3-----	Dibenz(A,H)Anthracene	6	U
191-24-2-----	Benzo(G,H,I)Perylene	10	U

1X
ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

27245-01FB

b Name: ENSECO

Contract:

IGV-W105FB-011993

Lab Code: ENSECO

Case No.: 27245

SAS No.:

SDG No.:

Matrix: (soil/water) WATER

Lab Sample ID: 27245-01FB

Sample wt/vol: 4200 (g/mL) ML

Lab File ID: C7222

Level: (low/med) LOW

Date Received: 01/20/93

% Moisture: decanted: (Y/N) N

Date Extracted: 01/21/93

Concentrated Extract Volume: 500(uL)

Date Analyzed: 01/22/93

Injection Volume: 2.0(uL)

Dilution Factor: 0.119

GPC Cleanup: (Y/N) N pH: 7.0

CONCENTRATION UNITS:
(ng/L or ug/Kg) ng/L

CAS NO.

COMPOUND

Q

271-89-6-----	2,3-Dibenzofuran	5	U
496-11-7-----	2,3-Dihydroindene	1	U
95-13-6-----	1H-Indene	0.9	U
91-20-3-----	Naphthalene	2	BJ
4565-32-6-----	Benzo(B)Thiophene	0.9	U
91-22-5-----	Quinoline	1	JR
120-72-9-----	1H-Indole	2	U
91-57-6-----	2-Methylnaphthalene	2	B
90-12-0-----	1-Methylnaphthalene	2	U
92-52-4-----	Biphenyl	4	U
208-96-8-----	Acenaphthylene	1	U
83-32-9-----	Acenaphthene	1	U
132-64-9-----	Dibenzofuran	1	U
86-73-7-----	Fluorene	1	U
132-65-0-----	Dibenzothiophene	1	U
85-01-8-----	Phenanthrene	3	B
120-12-7-----	Anthracene	1	U
260-94-6-----	Acridine	3	U
86-74-8-----	Carbazole	2	U
206-44-0-----	Fluoranthene	2	B
129-00-0-----	Pyrene	2	B
56-55-3-----	Benzo(A)Anthracene	2	U
218-01-9-----	Chrysene	3	U
205-99-2-----	Benzo(B)Fluoranthene	2	U
207-08-9-----	Benzo(K)Fluoranthene	2	U
192-97-2-----	Benzo(E)Pyrene	2	U
50-32-8-----	Benzo(A)Pyrene	2	U
198-55-0-----	Perylene	2	U
193-39-5-----	Indeno(1,2,3-CD)Pyrene	2	U
53-70-3-----	Dibenz(A,H)Anthracene	2	U
191-24-2-----	Benzo(G,H,I)Perylene	3	U

1X
ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

27245-01MS

Lab Name: ENSECO

Contract:

Lab Code: ENSECO

Case No.: 27245

SAS No.:

IGV-W105MS-011993

SDG No.:

Matrix: (soil/water) WATER

Lab Sample ID: 27245-01MS

Sample wt/vol: 4180 (g/mL) ML

Lab File ID: C7220

Level: (low/med) LOW

Date Received: 01/20/93

% Moisture: decanted: (Y/N) N

Date Extracted: 01/20/93

Concentrated Extract Volume: 500(uL)

Date Analyzed: 01/22/93

Injection Volume: 2.0(uL)

Dilution Factor: 0.120

GPC Cleanup: (Y/N) N pH: 7.0

CONCENTRATION UNITS:
(ng/L or ug/Kg) ng/L

CAS NO.

COMPOUND

Q

271-89-6-----	2,3-Dibenzofuran	2	J
496-11-7-----	2,3-Dihydroindene	140	R
95-13-6-----	1H-Indene	65	
91-20-3-----	Naphthalene	89	BRT
4565-32-6-----	Benzo(B)Thiophene	47	
91-22-5-----	Quinoline	140	
120-72-9-----	1H-Indole	10	
91-57-6-----	2-Methylnaphthalene	110	B
90-12-0-----	1-Methylnaphthalene	53	
92-52-4-----	Biphenyl	43	
208-96-8-----	Acenaphthylene	40	
83-32-9-----	Acenaphthene	120	
132-64-9-----	Dibenzofuran	67	
86-73-7-----	Fluorene	110	T
132-65-0-----	Dibenzothiophene	16	
85-01-8-----	Phenanthrene	89	BRT
120-12-7-----	Anthracene	59	
260-94-6-----	Acridine	24	R
86-74-8-----	Carbazole	66	
206-44-0-----	Fluoranthene	96	BRT
129-00-0-----	Pyrene	83	BRT
56-55-3-----	Benzo(A)Anthracene	11	R
218-01-9-----	Chrysene	25	
205-99-2-----	Benzo(B)Fluoranthene	1	J
207-08-9-----	Benzo(K)Fluoranthene	2	U
192-97-2-----	Benzo(E)Pyrene	4	
50-32-8-----	Benzo(A)Pyrene	2	U
198-55-0-----	Perylene	2	U
193-39-5-----	Indeno(1,2,3-CD)Pyrene	2	U
53-70-3-----	Dibenz(A,H)Anthracene	2	U
191-24-2-----	Benzo(G,H,I)Perylene	3	U

1X
ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

27245-01MSD

Name: ENSECO	Contract:	IGV-W105MSD-011993
Lab Code: ENSECO	Case No.: 27245	SDG No.:
Matrix: (soil/water) WATER		Lab Sample ID: 27245-01MSD
Sample wt/vol: 4140 (g/mL) ML		Lab File ID: C7221
Level: (low/med) LOW		Date Received: 01/20/93
% Moisture: decanted: (Y/N) N		Date Extracted: 01/20/93
Concentrated Extract Volume: 500(uL)		Date Analyzed: 01/22/93
Injection Volume: 2.0(uL)		Dilution Factor: 0.121
GPC Cleanup: (Y/N) N	pH: 7.0	

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ng/L or ug/Kg) ng/L	Q
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271-89-6-----	2,3-Dibenzofuran	2	J
496-11-7-----	2,3-Dihydroindene	130	R
95-13-6-----	1H-Indene	61	
91-20-3-----	Naphthalene	82	BRT
4565-32-6-----	Benzo(B)Thiophene	42	
91-22-5-----	Quinoline	130	
120-72-9-----	1H-Indole	5	
91-57-6-----	2-Methylnaphthalene	95	B
90-12-0-----	1-Methylnaphthalene	51	
92-52-4-----	Biphenyl	40	
208-96-8-----	Acenaphthylene	36	T
83-32-9-----	Acenaphthene	120	
132-64-9-----	Dibenzofuran	62	
86-73-7-----	Fluorene	110	T
132-65-0-----	Dibenzothiophene	15	R
85-01-8-----	Phenanthrene	94	BRT
120-12-7-----	Anthracene	54	
260-94-6-----	Acridine	20	R
86-74-8-----	Carbazole	57	
206-44-0-----	Fluoranthene	95	BRT
129-00-0-----	Pyrene	83	BRT
56-55-3-----	Benzo(A)Anthracene	12	R
218-01-9-----	Chrysene	25	
205-99-2-----	Benzo(B)Fluoranthene	1	JR
207-08-9-----	Benzo(K)Fluoranthene	2	U
192-97-2-----	Benzo(E)Pyrene	4	
50-32-8-----	Benzo(A)Pyrene	2	U
198-55-0-----	Perylene	2	U
193-39-5-----	Indeno(1,2,3-CD)Pyrene	2	U
53-70-3-----	Dibenz(A,H)Anthracene	2	U
191-24-2-----	Benzo(G,H,I)Perylene	3	U

1X
ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

27245-01MSDL

b Name: ENSECO

Contract:

IGV-W105MS-011993
SDG No.:

Lab Code: ENSECO

Case No.: 27245

SAS No.:

Matrix: (soil/water) WATER

Lab Sample ID: 27245-01MSDL

Sample wt/vol: 4180 (g/mL) ML

Lab File ID: C7238

Level: (low/med) LOW

Date Received: 01/20/93

% Moisture: decanted: (Y/N) N

Date Extracted: 01/20/93

Concentrated Extract Volume: 500(uL)

Date Analyzed: 01/26/93

Injection Volume: 2.0(uL)

Dilution Factor: 0.478

GPC Cleanup: (Y/N) N pH: 7.0

CONCENTRATION UNITS:
(ng/L or ug/Kg) ng/L

CAS NO.

COMPOUND

Q

271-89-6-----	2,3-Dibenzofuran	20	U
496-11-7-----	2,3-Dihydroindene	270	D
95-13-6-----	1H-Indene	94	D
91-20-3-----	Naphthalene	240	BD
4565-32-6-----	Benzo(B)Thiophene	61	D
91-22-5-----	Quinoline	120	D
120-72-9-----	1H-Indole	9	DJ
91-57-6-----	2-Methylnaphthalene	130	BD
90-12-0-----	1-Methylnaphthalene	69	D
92-52-4-----	Biphenyl	53	D
208-96-8-----	Acenaphthylene	36	D
83-32-9-----	Acenaphthene	160	D
132-64-9-----	Dibenzofuran	75	D
86-73-7-----	Fluorene	150	D
132-65-0-----	Dibenzothiophene	17	DR
85-01-8-----	Phenanthrene	210	BD
120-12-7-----	Anthracene	42	D
260-94-6-----	Acridine	16	D
86-74-8-----	Carbazole	45	D
206-44-0-----	Fluoranthene	190	BD
129-00-0-----	Pyrene	150	BD
56-55-3-----	Benzo(A)Anthracene	11	D
218-01-9-----	Chrysene	31	D
205-99-2-----	Benzo(B)Fluoranthene	10	U
207-08-9-----	Benzo(K)Fluoranthene	9	U
192-97-2-----	Benzo(E)Pyrene	5	DJ
50-32-8-----	Benzo(A)Pyrene	9	U
198-55-0-----	Perylene	10	U
193-39-5-----	Indeno(1,2,3-CD)Pyrene	8	U
53-70-3-----	Dibenz(A,H)Anthracene	6	U
191-24-2-----	Benzo(G,H,I)Perylene	11	U

1X
ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

27245-01SDDL

b Name: ENSECO

Contract:

IGV-W105MSD-011993
SDG No.:

Lab Code: ENSECO Case No.: 27245

SAS No.:

Matrix: (soil/water) WATER

Lab Sample ID: 27245-01SDDL

Sample wt/vol: 4140 (g/mL) ML

Lab File ID: C7239

Level: (low/med) LOW

Date Received: 01/20/93

% Moisture: decanted: (Y/N) N

Date Extracted: 01/20/93

Concentrated Extract Volume: 500(uL)

Date Analyzed: 01/26/93

Injection Volume: 2.0(uL)

Dilution Factor: 0.483

GPC Cleanup: (Y/N) N pH: 7.0

CONCENTRATION UNITS:
(ng/L or ug/Kg) ng/L

CAS NO.

COMPOUND

Q

271-89-6-----	2,3-Dibenzofuran	20	U
496-11-7-----	2,3-Dihydroindene	260	D
95-13-6-----	1H-Indene	88	D
91-20-3-----	Naphthalene	210	BD
4565-32-6-----	Benzo(B)Thiophene	55	D
91-22-5-----	Quinoline	110	D
120-72-9-----	1H-Indole	5	DJ
91-57-6-----	2-Methylnaphthalene	120	BD
90-12-0-----	1-Methylnaphthalene	65	D
92-52-4-----	Biphenyl	50	D
208-96-8-----	Acenaphthylene	35	D
83-32-9-----	Acenaphthene	150	D
132-64-9-----	Dibenzofuran	72	D
86-73-7-----	Fluorene	140	D
132-65-0-----	Dibenzothiophene	17	DR
85-01-8-----	Phenanthrene	200	BD
120-12-7-----	Anthracene	39	D
260-94-6-----	Acridine	14	D
86-74-8-----	Carbazole	40	D
206-44-0-----	Fluoranthene	190	BD
129-00-0-----	Pyrene	160	BD
56-55-3-----	Benzo(A)Anthracene	12	DR
218-01-9-----	Chrysene	33	D
205-99-2-----	Benzo(B)Fluoranthene	10	U
207-08-9-----	Benzo(K)Fluoranthene	9	U
192-97-2-----	Benzo(E)Pyrene	5	DJ
50-32-8-----	Benzo(A)Pyrene	9	U
198-55-0-----	Perylene	10	U
193-39-5-----	Indeno(1,2,3-CD)Pyrene	8	U
53-70-3-----	Dibenz(A,H)Anthracene	6	U
191-24-2-----	Benzo(G,H,I)Perylene	11	U

2C
WATER SEMIVOLATILE SURROGATE RECOVERY

Lab Name: ENSECO

Contract:

Code: ENSECO

Case No.: 27245

SAS No.:

SDG No.:

	EPA SAMPLE NO.	S1 (NAP) #	S2 (FLU) #	S3 (CHR) #	TOT OUT
01	27245-01	66	80	32	0
02	27245-01DL	68	70	39	0
03	27245-01DU	67	84	26	0
04	27245-01DUDL	97	89	36	0
05	27245-01FB	66	76	69	0
06	27245-01MS	66	82	26	0
07	27245-01MSD	63	78	27	0
08	27245-01MSDL	91	83	34	0
09	27245-01SDDL	87	81	39	0
10	BLK01	82	88	62	0
11	BLK02	80	90	68	0

	QC LIMITS
S1 (NAP) = Naphthalene-d8	(14-108)
S2 (FLU) = Fluorene-d10	(41-162)
S3 (CHR) = Chrysene-d12	(10-118)

Column to be used to flag recovery values
 * Values outside of contract required QC limits
 D Surrogate diluted out

3C

WATER SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: ENSECO

Contract:

Lab Code: ENSECO

Case No.: 27245

SAS No.:

SDG No.:

Matrix Spike - EPA Sample No.: 27245-01

COMPOUND	SPIKE ADDED (ng/L)	SAMPLE CONCENTRATION (ng/L)	MS CONCENTRATION (ng/L)	MS % REC #	QC LIMITS REC.
1H-Indene	71.8	22.25	64.56	60	20-150
Naphthalene	71.8	92.46	88.92	-5 *	20-150
Quinoline	71.8	3.082	141.6	193 *	20-150
2-Methylnaphthalene	71.8	60.81	105.1	62	20-150
Fluorene	71.8	87.23	106.8	27	20-150
Chrysene	71.8	9.068	24.84	22	20-150
Benzo(E) Pyrene	71.8	1.155	3.984	4 *	10-150

COMPOUND	SPIKE ADDED (ng/L)	MSD CONCENTRATION (ng/L)	MSD % REC #	% RPD #	QC LIMITS RPD	REC.
1H-Indene	72.6	60.74	53	12	28	20-150
Naphthalene	72.6	82.16	-14 *	95 *	28	20-150
Quinoline	72.6	134.3	181 *	6	28	20-150
2-Methylnaphthalene	72.6	94.86	47	28	28	20-150
Fluorene	72.6	107.0	27	0	28	20-150
Chrysene	72.6	25.17	22	0	28	20-150
Benzo(E) Pyrene	72.6	4.066	4 *	0	28	10-150

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

COMMENTS:

3C
WATER SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: ENSECO

Contract:

Lab Code: ENSECO

Case No.: 27245

SAS No.:

SDG No.:

Matrix Spike - EPA Sample No.: 27245-01DL

COMPOUND	SPIKE ADDED (ng/L)	SAMPLE CONCENTRATION (ng/L)	MS CONCENTRATION (ng/L)	MS % REC #	QC LIMITS REC.
1H-Indene	71.8	25.94	94.17	95	20-150
Naphthalene	71.8	127.8	242.8	160 *	20-150
Quinoline	71.8	1.937	121.4	166 *	20-150
2-Methylnaphthalene	71.8	56.17	126.2	98	20-150
Fluorene	71.8	77.83	146.7	96	20-150
Chrysene	71.8	9.449	31.26	30	20-150
Benzo(E) Pyrene	71.8	ND	4.656	6 *	10-150

COMPOUND	SPIKE ADDED (ng/L)	MSD CONCENTRATION (ng/L)	MSD % REC #	% RPD #	QC LIMITS RPD	REC.
1H-Indene	72.6	87.91	85	11	28	20-150
Naphthalene	72.6	213.0	117	31 *	28	20-150
Quinoline	72.6	115.0	156 *	6	28	20-150
2-Methylnaphthalene	72.6	116.4	83	17	28	20-150
Fluorene	72.6	141.0	87	10	28	20-150
Chrysene	72.6	32.51	32	6	28	20-150
Benzo(E) Pyrene	72.6	4.975	7 *	15	28	10-150

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

COMMENTS:

4B
SEMIVOLATILE METHOD BLANK SUMMARY

EPA SAMPLE NO.

BLK01

b Name: ENSECO

Contract:

Lab Code: ENSECO

Case No.: 27245

SAS No.:

SDG No.:

Lab File ID: C7224

Lab Sample ID: BL012093

Instrument ID: 4500-C

Date Extracted: 01/20/93

Matrix: (soil/water) WATER

Date Analyzed: 01/22/93

Level: (low/med) LOW

Time Analyzed: 2137

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01	27245-01	27245-01	C7218	01/22/93
02	27245-01DL	27245-01DL	C7234	01/26/93
03	27245-01DU	27245-01DU	C7219	01/22/93
04	27245-01DUDL	27245-01DUDL	C7237	01/26/93
05	27245-01MS	27245-01MS	C7220	01/22/93
06	27245-01MSD	27245-01MSD	C7221	01/22/93
07	27245-01MSDL	27245-01MSDL	C7238	01/26/93
08	27245-01SDDL	27245-01SDDL	C7239	01/26/93

COMMENTS:

1X
ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

BLK01

b Name: ENSECO

Contract:

Lab Code: ENSECO

Case No.: 27245

SAS No.:

SDG No.:

Matrix: (soil/water) WATER

Lab Sample ID: BL012093

Sample wt/vol: 4000 (g/mL) ML

Lab File ID: C7224

Level: (low/med) LOW

Date Received:

% Moisture: decanted: (Y/N) N

Date Extracted: 01/20/93

Concentrated Extract Volume: 500(uL)

Date Analyzed: 01/22/93

Injection Volume: 2.0(uL)

Dilution Factor: 0.125

GPC Cleanup: (Y/N) N pH: 7.0

CONCENTRATION UNITS:
(ng/L or ug/Kg) ng/L

CAS NO.

COMPOUND

Q

271-89-6-----	2,3-Dibenzofuran	5	U
496-11-7-----	2,3-Dihydroindene	1	U
95-13-6-----	1H-Indene	0.9	U
91-20-3-----	Naphthalene	1	JR
4565-32-6-----	Benzo(B)Thiophene	0.9	U
91-22-5-----	Quinoline	1	U
120-72-9-----	1H-Indole	2	U
91-57-6-----	2-Methylnaphthalene	2	
90-12-0-----	1-Methylnaphthalene	2	U
92-52-4-----	Biphenyl	4	U
208-96-8-----	Acenaphthylene	1	U
83-32-9-----	Acenaphthene	1	U
132-64-9-----	Dibenzofuran	1	U
86-73-7-----	Fluorene	1	U
132-65-0-----	Dibenzothiophene	1	U
85-01-8-----	Phenanthrene	2	
120-12-7-----	Anthracene	1	U
260-94-6-----	Acridine	3	U
86-74-8-----	Carbazole	2	U
206-44-0-----	Fluoranthene	1	J
129-00-0-----	Pyrene	1	J
56-55-3-----	Benzo(A)Anthracene	2	U
218-01-9-----	Chrysene	3	U
205-99-2-----	Benzo(B)Fluoranthene	2	U
207-08-9-----	Benzo(K)Fluoranthene	2	U
192-97-2-----	Benzo(E)Pyrene	2	U
50-32-8-----	Benzo(A)Pyrene	2	U
198-55-0-----	Perylene	2	U
193-39-5-----	Indeno(1,2,3-CD)Pyrene	2	U
53-70-3-----	Dibenz(A,H)Anthracene	2	U
191-24-2-----	Benzo(G,H,I)Perylene	3	U

4B
SEMIVOLATILE METHOD BLANK SUMMARY

EPA SAMPLE NO.

BLK02

Name: ENSECO

Contract:

Lab Code: ENSECO

Case No.: 27245

SAS No.:

SDG No.:

Lab File ID: C7225

Lab Sample ID: 27245-01FB

Instrument ID: 4500-C

Date Extracted: 01/21/93

Matrix: (soil/water) WATER

Date Analyzed: 01/22/93

Level: (low/med) LOW

Time Analyzed: 2227

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01	27245-01FB	27245-01FB	C7222	01/22/93

COMMENTS:

1X
ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

BLK02

b Name: ENSECO

Contract:

Lab Code: ENSECO

Case No.: 27245

SAS No.:

SDG No.:

Matrix: (soil/water) WATER

Lab Sample ID:

Sample wt/vol: 4000 (g/mL) ML

Lab File ID: C7225

Level: (low/med) LOW

Date Received:

% Moisture: decanted: (Y/N) N

Date Extracted: 01/21/93

Concentrated Extract Volume: 500(uL)

Date Analyzed: 01/22/93

Injection Volume: 2.0(uL)

Dilution Factor: 0.125

GPC Cleanup: (Y/N) N pH: 7.0

CONCENTRATION UNITS:
(ng/L or ug/Kg) ng/L

CAS NO.

COMPOUND

Q

271-89-6-----	2,3-Dibenzofuran	5	U
496-11-7-----	2,3-Dihydroindene	1	U
95-13-6-----	1H-Indene	0.9	U
91-20-3-----	Naphthalene	1	J
4565-32-6-----	Benzo(B)Thiophene	0.9	U
91-22-5-----	Quinoline	1	U
120-72-9-----	1H-Indole	2	U
91-57-6-----	2-Methylnaphthalene	1	
90-12-0-----	1-Methylnaphthalene	2	U
92-52-4-----	Biphenyl	4	U
208-96-8-----	Acenaphthylene	1	U
83-32-9-----	Acenaphthene	1	U
132-64-9-----	Dibenzofuran	1	U
86-73-7-----	Fluorene	1	U
132-65-0-----	Dibenzothiophene	1	U
85-01-8-----	Phenanthrene	3	
120-12-7-----	Anthracene	1	U
260-94-6-----	Acridine	3	U
86-74-8-----	Carbazole	2	U
206-44-0-----	Fluoranthene	1	J
129-00-0-----	Pyrene	1	J
56-55-3-----	Benzo(A)Anthracene	2	U
218-01-9-----	Chrysene	3	U
205-99-2-----	Benzo(B)Fluoranthene	2	U
207-08-9-----	Benzo(K)Fluoranthene	2	U
192-97-2-----	Benzo(E)Pyrene	2	U
50-32-8-----	Benzo(A)Pyrene	2	U
198-55-0-----	Perylene	2	U
193-39-5-----	Indeno(1,2,3-CD)Pyrene	2	U
53-70-3-----	Dibenz(A,H)Anthracene	2	U
191-24-2-----	Benzo(G,H,I)Perylene	3	U

5B
SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK

Lab Name: ENSECO

Contract:

Lab Code: ENSECO

Case No.: 27245

SAS No.:

SDG No.:

Lab File ID: . BC012193T

Run Date: 01/21/93

Instrument ID: 4500-C

Run Time: 0949

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	SSTD040	40_PPb_PAH	C7209	01/21/93	0949
02	SSTD020	20_PPb_PAH	C7210	01/21/93	1047
03	SSTD1200	1200_PPb_PAH	C7211	01/21/93	1137
04	SSTD600	600_PPb_PAH	C7212	01/21/93	1227
05	SSTD240	240_PPb_PAH	C7213	01/21/93	1317

5B
SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK

Lab Name: ENSECO

Contract:

Lab Code: ENSECO

Case No.: 27245

SAS No.:

SDG No.:

Lab File ID: C7217T

Run Date: 01/22/93

Instrument ID: 4500-C

Run Time: 1545

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	SSTD040	40 PPB PAH	C7217	01/22/93	1545
02	27245-01	27245-01	C7218	01/22/93	1635
03	27245-01DU	27245-01DU	C7219	01/22/93	1725
04	27245-01MS	27245-01MS	C7220	01/22/93	1725
05	27245-01MSD	27245-01MSD	C7221	01/22/93	1906
06	27245-01FB	27245-01FB	C7222	01/22/93	1957
07	BLK01	BL012093	C7224	01/22/93	2137
08	BLK02		C7225	01/22/93	2227

5B
SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK

Lab Name: ENSECO

Contract:

Lab Code: ENSECO

Case No.: 27245

SAS No.:

SDG No.:

Lab File ID: C7233T

Run Date: 01/26/93

Instrument ID: 4500-C

Run Time: 0928

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	SSTD040	40 PPB PAH	C7233	01/26/93	0928
02	27245-01DL	27245-01DL	C7234	01/26/93	1126
03	27245-01DUDL	27245-01DUDL	C7237	01/26/93	1400
04	27245-01MSDL	27245-01MSDL	C7238	01/26/93	1452
05	27245-01SDDL	27245-01SDDL	C7239	01/26/93	1544

6B
SEMIVOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: ENSECO

Contract:

Lab Code: ENSECO

Case No.: STAND

SAS No.:

SDG No.:

Instrument ID: 4500-C

Calibration Date(s): 01/21/93

01/21/93

Calibration Times: 0949

1317

LAB FILE ID:	RRF20 = C7210	RRF40 = C7209
RRF240= C7213	RRF600= C7212	RF1200= C7211

COMPOUND	RRF20	RRF40	RRF240	RRF600	RF1200	RRF	% RSD
2,3-Dibenzofuran	0.867	0.865	0.828	0.865	1.177	0.920	15.7
2,3-Dihydroindene	0.915	0.809	0.795	0.853	1.065	0.887	12.4
1H-Indene	1.487	1.360	1.430	1.532	1.903	1.542	13.7
Naphthalene	2.354	1.989	1.931	2.235	2.287	2.159	8.7
Benzo(B)Thiophene	1.338	1.222	1.268	1.504	1.595	1.385	11.5
Quinoline	0.547	0.649	0.658	0.878	1.012	0.749	25.4
1H-Indole	0.617	0.730	0.893	1.028	1.128	0.879	23.8
2-Methylnaphthalene	0.957	0.895	0.872	1.059	1.046	0.966	8.8
1-Methylnaphthalene	1.347	1.231	1.328	1.455	1.429	1.358	6.5
Biphenyl	1.288	1.354	1.447	1.739	1.622	1.490	12.6
Acenaphthylene	1.383	1.386	1.555	1.951	1.892	1.633	16.7
Acenaphthene	1.164	1.129	1.273	1.450	1.391	1.281	10.9
Dibenzofuran	1.595	1.509	1.705	1.882	1.810	1.700	9.0
Fluorene	1.448	1.336	1.630	1.736	1.693	1.569	10.8
Dibenzothiophene	0.907	0.820	0.956	1.055	0.965	0.941	9.1
Benanthrene	0.974	0.852	0.961	1.063	0.978	0.966	7.8
Anthracene	0.676	0.677	0.832	0.963	0.933	0.816	16.7
Acridine	0.337	0.373	0.448	0.602	0.651	0.482	28.8
Carbazole	0.558	0.652	0.774	0.887	0.910	0.756	20.0
Fluoranthene	0.759	0.883	1.050	1.129	1.159	0.996	17.1
Pyrene	1.074	1.034	1.231	1.255	1.245	1.168	9.0
Benzo(A)Anthracene	1.212	1.075	1.553	1.641	1.586	1.413	17.9
Chrysene	1.487	1.287	1.611	1.699	1.573	1.531	10.2
Benzo(B)Fluoranthene	1.596	1.549	1.626	1.833	1.704	1.662	6.7
Benzo(K)Fluoranthene	1.527	1.283	1.436	1.674	1.611	1.506	10.2
Benzo(E)Pyrene	1.614	1.481	1.546	1.747	1.607	1.599	6.2
Benzo(A)Pyrene	1.303	1.213	1.201	1.489	1.484	1.338	10.6
Perylene	1.330	1.292	1.266	1.636	1.622	1.429	12.9
Indeno(1,2,3-CD)Pyrene	1.344	1.191	1.160	1.492	1.395	1.316	10.6
Dibenz(A,H)Anthracene	1.195	1.043	1.097	1.357	1.261	1.191	10.6
Benzo(G,H,I)Perylene	1.435	1.264	1.239	1.465	1.324	1.345	7.5
Naphthalene-d8	1.330	1.266	1.242	1.465	1.572	1.375	10.2
Fluorene-d10	1.012	0.969	1.143	1.268	1.211	1.121	11.4
Chrysene-d12	1.303	1.013	1.215	1.203	1.156	1.178	9.0

7B
SEMIVOLATILE CONTINUING CALIBRATION CHECK

Lab Name: ENSECO

Contract:

Lab Code: ENSECO

Case No.: 27245

SAS No.:

SDG No.:

Instrument ID: 4500-C

Calibration date: 01/22/93 Time: 1545

Lab File ID: C7217

Init. Calib. Date(s): 01/21/93 01/21/93

Init. Calib. Times: 0949 1317

COMPOUND	RRF	RRF40	MIN RRF	%D	MAX %D
2,3-Dibenzofuran	1.815	0.922		49.2	35.0
2,3-Dihydroindene	1.682	0.826		50.9	35.0
1H-Indene	2.959	1.537		48.1	35.0
Naphthalene	3.842	2.026		47.3	35.0
Benzo(B)Thiophene	2.569	1.293		49.7	35.0
Quinoline	1.528	0.704		53.9	35.0
1H-Indole	1.723	0.670		61.1	35.0
2-Methylnaphthalene	1.746	0.853		51.2	35.0
1-Methylnaphthalene	2.401	1.222		49.1	35.0
Biphenyl	2.698	1.244		53.9	35.0
Acenaphthylene	3.037	1.626		46.5	35.0
Acenaphthene	2.300	1.008		56.2	35.0
Dibenzofuran	3.017	1.510		50.0	35.0
Fluorene	2.784	1.314		52.8	35.0
Dibenzothiophene	1.632	0.767		53.0	35.0
Phenanthrene	1.667	0.856		48.6	35.0
Anthracene	1.497	0.637		57.4	35.0
Acridine	0.972	0.352		63.8	35.0
Carbazole	1.435	0.603		58.0	35.0
Fluoranthene	1.856	0.940		49.4	35.0
Pyrene	2.067	1.120		45.8	35.0
Benzo(A)Anthracene	2.527	1.549		38.7	35.0
Chrysene	2.641	1.728		34.6	35.0
Benzo(B)Fluoranthene	2.915	1.635		43.9	35.0
Benzo(K)Fluoranthene	2.669	1.609		39.7	35.0
Benzo(E)Pyrene	2.772	1.530		44.8	35.0
Benzo(A)Pyrene	2.445	1.297		47.0	35.0
Perylene	2.650	1.144		56.8	35.0
Indeno(1,2,3-CD)Pyrene	2.350	1.003		57.3	35.0
Dibenz(A,H)Anthracene	2.113	0.921		56.4	35.0
Benzo(G,H,I)Perylene	2.315	1.065		54.0	35.0
Naphthalene-d8	2.554	1.599		37.4	35.0
Fluorene-d10	1.999	0.963		51.8	35.0
Chrysene-d12	1.981	1.294		34.7	35.0

7B
SEMIVOLATILE CONTINUING CALIBRATION CHECK

Lab Name: ENSECO

Contract:

Lab Code: ENSECO

Case No.: 27245

SAS No.:

SDG No.:

Instrument ID: 4500-C

Calibration date: 01/26/93 Time: 0928

Lab File ID: C7233

Init. Calib. Date(s): 01/21/93 01/21/93

Init. Calib. Times: 0949 1317

COMPOUND	RRF	RRF40	MIN RRF	%D	MAX %D
2,3-Dibenzofuran	1.815	0.954		47.4	35.0
2,3-Dihydroindene	1.682	0.910		45.9	35.0
1H-Indene	2.959	1.608		45.7	35.0
Naphthalene	3.842	2.160		43.8	35.0
Benzo(B)Thiophene	2.569	1.344		47.7	35.0
Quinoline	1.528	0.955		37.5	35.0
1H-Indole	1.723	1.069		38.0	35.0
2-Methylnaphthalene	1.746	0.867		50.3	35.0
1-Methylnaphthalene	2.401	1.195		50.2	35.0
Biphenyl	2.698	1.421		47.3	35.0
Acenaphthylene	3.037	2.021		33.4	35.0
Acenaphthene	2.300	1.274		44.6	35.0
Dibenzofuran	3.017	1.548		48.7	35.0
Fluorene	2.784	1.510		45.8	35.0
Dibenzothiophene	1.632	0.800		51.0	35.0
Phenanthrene	1.667	1.079		35.3	35.0
Anthracene	1.497	1.051		29.8	35.0
Acridine	0.972	0.534		45.1	35.0
Carbazole	1.435	0.966		32.7	35.0
Fluoranthene	1.856	0.903		51.4	35.0
Pyrene	2.067	0.985		52.4	35.0
Benzo(A)Anthracene	2.527	1.837		27.3	35.0
Chrysene	2.641	1.885		28.6	35.0
Benzo(B)Fluoranthene	2.915	1.633		44.0	35.0
Benzo(K)Fluoranthene	2.669	1.375		48.5	35.0
Benzo(E)Pyrene	2.772	1.430		48.4	35.0
Benzo(A)Pyrene	2.445	1.365		44.2	35.0
Perylene	2.650	1.429		46.1	35.0
Indeno(1,2,3-CD)Pyrene	2.350	1.094		53.4	35.0
Dibenz(A,H)Anthracene	2.113	0.935		55.8	35.0
Benzo(G,H,I)Perylene	2.315	1.031		55.5	35.0
Naphthalene-d8	2.554	1.501		41.2	35.0
Fluorene-d10	1.999	0.927		53.6	35.0
Chrysene-d12	1.981	1.388		29.9	35.0

8B
SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ENSECO

Contract:

Lab Code: ENSECO

Case No.: 27245

SAS No.:

SDG No.:

Lab File ID (Standard): C7217

Date Analyzed: 01/22/93

Instrument ID: 4500-C

Time Analyzed: 1545

	IS1 (ACN) AREA #	RT #	IS2 (PHN) AREA #	RT #	IS3 (BAP) AREA #	RT #
12 HOUR STD	413057	15.79	813300	19.52	545491	29.41
UPPER LIMIT	826114	16.29	1626600	20.02	1090982	29.91
LOWER LIMIT	206528	15.29	406650	19.02	272746	28.91
EPA SAMPLE NO.						
01 27245-01	591536	15.80	1081440	19.55	578397	29.41
02 27245-01DU	714636	15.80	1345360	19.54	652496	29.41
03 27245-01FB	606679	15.79	1221030	19.52	587044	29.41
04 27245-01MS	667111	15.79	1315990	19.52	614106	29.39
05 27245-01MSD	661241	15.79	1287550	19.54	597379	29.41
06 BLK01	506312	15.79	1015770	19.52	536905	29.41
07 BLK02	539991	15.79	1033080	19.54	540148	29.39

IS1 (ACN) = Acenaphthene-D10

IS2 (PHN) = Phenanthrene-D10

IS3 (BAP) = Benzo(A)Pyrene-D10

AREA UPPER LIMIT = + 100% of internal standard area.

AREA LOWER LIMIT = - 50% of internal standard area.

RT UPPER LIMIT = +0.50 minutes of internal standard RT.

RT LOWER LIMIT = -0.50 minutes of internal standard RT.

Column used to flag internal standard area values with an asterisk.

* Values outside of QC limits.

8B
SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ENSECO

Contract:

Lab Code: ENSECO

Case No.: 27245

SAS No.:

SDG No.:

Lab File ID (Standard): C7233

Date Analyzed: 01/26/93

Instrument ID: 4500-C

Time Analyzed: 0928

	IS1 (ACN) AREA #	RT #	IS2 (PHN) AREA #	RT #	IS3 (BAP) AREA #	RT #
12 HOUR STD	496360	15.60	909593	19.32	394123	29.14
UPPER LIMIT	992720	16.10	1819186	19.82	788246	29.64
LOWER LIMIT	248180	15.10	454796	18.82	197062	28.64
EPA SAMPLE NO.						
01 27245-01DL	574944	15.59	1069780	19.34	295603	29.17
02 27245-01DUDL	503787	15.60	876199	19.34	269849	29.17
03 27245-01MSDL	504159	15.62	880029	19.37	259520	29.16
04 27245-01SDDL	487440	15.60	873176	19.34	247392	29.17

IS1 (ACN) = Acenaphthene-D10

IS2 (PHN) = Phenanthrene-D10

IS3 (BAP) = Benzo(A)Pyrene-D10

AREA UPPER LIMIT = + 100% of internal standard area.

AREA LOWER LIMIT = - 50% of internal standard area.

RT UPPER LIMIT = +0.50 minutes of internal standard RT.

RT LOWER LIMIT = -0.50 minutes of internal standard RT.

Column used to flag internal standard area values with an asterisk.

* Values outside of QC limits.